GENERAL METHODS OF TEACHING IN ELEMENTARY SCHOOLS

PARKER

BOOKS ON EDUCATION

BY

SAMUEL CHESTER PARKER

Professor of Educational Methods in
The University of Chicago

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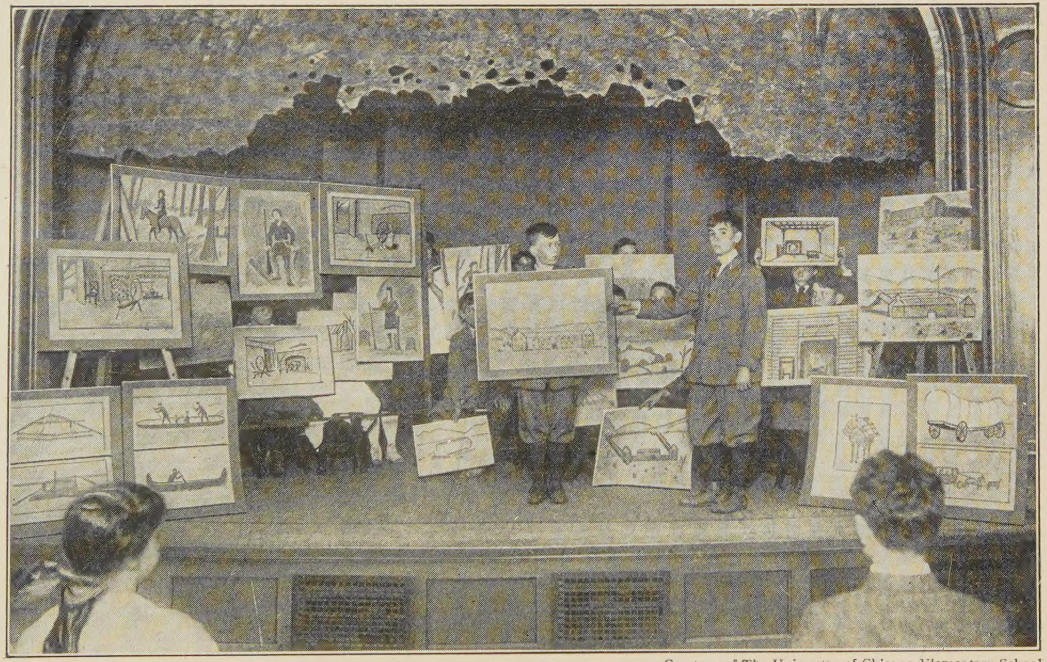

Courtesy of The University of Chicago Elementary School

WITH INEXPENSIVE MATERIALS SUCH EDUCATIVE ACTIVITIES ARE POSSIBLE IN ANY SCHOOL

For the story of this picture, see page 5

GENERAL METHODS OF TEACHING IN ELEMENTARY SCHOOLS

INCLUDING THE KINDERGARTEN

BY

SAMUEL CHESTER PARKER

PROFESSOR OF EDUCATIONAL METHODS IN THE
UNIVERSITY OF CHICAGO

REVISED EDITION

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TO

THE TEACHERS OF THE ELEMENTARY SCHOOL

OF THE UNIVERSITY OF CHICAGO

WHOSE EXCELLENT TEACHING HAS FURNISHED

MANY SUGGESTIONS TO THE AUTHOR

PREFACE

Readers. — This book has been prepared for use in normal schools, kindergarten training schools, and teachers' reading circles. Hence it has been made quite elementary in content and adapted to the understanding of freshman and sophomore students of approximately eighteen to twenty years of age.

Origin. — The work is the outcome of some fifteen years' experience by the author in teaching students of this type — five years in the State Normal College at Oxford, Ohio, and the rest in The University of Chicago. In the latter institution many of the students have been preparing for unified kindergarten-primary teaching.

Scope. — By limiting the illustrations in this volume to teaching in elementary schools it has been possible to make the discussion quite concrete. While the general principles presented apply equally well to high schools, teachers in the latter will find the author's "Methods of Teaching in High Schools" (Ginn and Company, 1915) and his Exercises for "Methods of Teaching in High Schools" (1918) more suggestive than the present volume.

Continuation. — Further chapters, dealing with the training of pupils in writing, spelling, reading, arithmetic, understanding social life, problem solving, communicating ideas, enjoyment, and moral behavior, are contained in the author's "Types of Elementary Teaching and Learning" (Ginn and Company).

Scientific basis. — The scientific basis for a part of the discussion in the book is found in modern experimental and statistical studies in education and psychology, such as the investigations of relative values in arithmetic and spelling, of drill processes in formal subjects, and of individual differences in capacities for learning. In many cases, however, where precise, objective, scientific investigations are lacking, I have relied on authoritative analytical discussions such as the works of William James.

Influences. — The author's general point of view has been determined by a number of influences, including a year of training in experimental psychology and education under Professor C. H. Judd at the University of Cincinnati (1901–1902) and two years of graduate study under Professors John Dewey and E. L. Thorndike of Columbia University. The latter's textbook entitled "Principles of Teaching" (1905) has been especially influential, since I have used it as a basis of discussion in my classes for many years. Five years' experience in administrative work in The University of Chicago served to impress upon me the importance of scientific business management in any social organization.

Point of view. — In general, the author takes the point of view that efficiency and economy in instruction are facilitated by (1) radically adapting all instruction to contemporary social needs; (2) basing methods of instruction on sound psychological principles which have been determined, as far as possible, experimentally; and (3) applying principles of scientific business management to the conduct of all teaching. The first of these standards eliminates processes that have no direct social value; the second eliminates waste of effort resulting from the use of uneconomical and ineffective methods of learning; the third eliminates waste of time which results from failure to standardize materials and processes.

Concrete material. — Much of the concrete material in the book has been derived from the course of study and teaching of the Elementary School of The University of Chicago. This school of some three hundred and fifty children is not a "freak" school. One of its purposes is to aid the School of Education in preparing teachers and supervisors for the regular work of public schools; hence it aims to carry on in the best possible manner the same lines of work as are found in the best public schools. Like these schools, it has a well-graded, systematic, detailed course of study, regular printed daily programs which are carefully followed, regular textbooks with an excellent supplementary library of children's books, printed reading charts and cards for primary work, ready-made drill materials for arithmetic, standard scientific tests for measuring progress, a school garden, and a school museum containing materials to be used in history and the sciences. The children are usually organized into groups of sixteen to twenty, with half-year intervals for classification. Careful supervision has enabled the school to effect such economies that a very rich elementary course of study is completed in seven years. In addition to examples from the University Elementary School, the book contains illustrations of teaching taken from many other sources.

Kindergarten. — The kindergarten is treated in this book as the first regular grade of the elementary school, as is now the case in the better public schools. For much of the concrete material which is used to illustrate this type of kindergarten work I am especially indebted to Miss Alice Temple, head of the department of Kindergarten-Primary Education in The University of Chicago. Miss Patty Hill of the Department of Lower-Primary Education of Teachers College, Columbia University, kindly furnished a number of pictures illustrating the progressive kindergarten teaching in that institution.

Other assistance. — To others of my colleagues I am indebted for many suggestions: to Professor J. F. Bobbitt in matters concerning the curriculum; to Professors C. H. Judd and F. N. Freeman for their *new* educational psychology, which has proved so fruitful in the study of how children learn; and especially to Professor W. S. Gray for suggestions which have led to many rearrangements of topics. Mr. H. O. Gillet, principal of The University of Chicago Elementary School, kindly furnished many photographs of the school's activities for use as illustrations in the text. Finally, from my students, especially the expert, experienced teachers in elementary schools, I have received many helpful illustrations and examples.

S. C. PARKER

PREFACE TO THE REVISED EDITION

I have taken advantage of the opportunity offered by the printing of a new impression of the "General Methods of Teaching in Elementary Schools" to make certain improvements in the text. Some of these are merely changes in the headlines in order to clarify the organization at certain points. The most important change, however, is the addition of Chapter XII on Project Teaching. While the original edition, through its numerous pictures, stories, and descriptions of actual projects, provided abundant discussion of this general phase of learning and teaching, it seemed desirable to amplify the treatment by a special chapter which would bring out quite clearly the meaning, history, value, limitations, and technique of project teaching. The addition of this chapter necessitated a few changes in the definition and use of the term "project" in Chapter V on Organizing Subject Matter, particularly on pages 121 and 128.

S. C. PARKER

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KEY TO BIBLIOGRAPHICAL REFERENCES

The books from which quotations are made in the text are included in the bibliographies which are printed at the ends of the chapters. The source of each quotation is indicated (usually at its end) by two figures in parenthesis. The first figure refers to the book by its number in the bibliography at the end of the chapter, and the second figure refers to the page. Thus, (**4**: 76) means page 76 in the fourth book in the chapter bibliography. This system has been adopted in order that the instructor or student may verify or follow up any quotation, but at the same time the ordinary reader will not be distracted by numerous footnote references which are unimportant in his reading.

GENERAL METHODS OF TEACHING IN ELEMENTARY SCHOOLS

PART I. FUNDAMENTAL POINTS OF VIEW

CHAPTER I

INTRODUCTION TO ARTISTIC TEACHING

Purpose. — The purpose of this book is to introduce prospective elementary-school teachers to the principles which underlie good teaching.

An elementary discussion of established ideas. — It is assumed that the readers know little about teaching; hence the discussions are quite elementary in character. The author is not presenting new educational ideas, but is endeavoring to make established ideas clear to beginners. It is assumed, however, that the readers are high-school graduates who are probably pursuing courses in normal schools, hence it is expected that they will be able to understand discussions which are no more difficult than the courses in history, civics, or science offered in high schools.

Discussion relates to ordinary city-school teaching. — The teaching situations which the author has in mind throughout the discussions are ordinary, fairly well-graded rooms in city or town schools with about forty children in a room. It is assumed that there is fairly good equipment; for example, sets of supplementary readers, cards for drill work, materials for constructive activities and for games, wall maps, possibly globes, etc. It is assumed that the prospective teachers are aiming to become specialists in kindergarten or primary teaching or in teaching in the middle or upper grades.

Teachers may become growing, enthusiastic artists. — It is assumed, further, that the readers are sincerely interested in improving as teachers and becoming real artists in their field, for teaching may be practiced as a fine art similar to that of an actor, musician, painter, or writer. As the teacher masters the principles, methods, tools, and devices of teaching, she may strive for finer and finer effects in the same way that an artist does. In her earlier teaching she may be satisfied to gain practice and skill in some of the cruder points of teaching, such as avoiding waste of time, securing good discipline, and having most of the children understand what is studied. But after one or two years of experience she may strive for finer effects and begin to differentiate her pupils carefully, to understand the capacities, needs, and progress of each individual, and to secure zest and interest in all work. Some teachers are so much interested in improvement of this type that they spend several years developing their technique in one grade or series of grades, — for example, in the kindergarten or the primary grades, — and find a never-ending field of artistic improvement in such specialized teaching, just as one painter might spend his life studying and practicing the painting of landscapes, while another paints only portraits. The artist-teacher, moreover, has especially interesting material to work with, namely, the plastic and varied personalities of her pupils.

City systems and normal schools provide for specialization in grade teaching. — Educators, as a rule, realize the large possibilities of such specialized technique and improved teaching within a single grade. As a consequence, in city systems, at the present time, expert primary teachers are paid as high salaries as upper-grade teachers, and are not "promoted" to the upper grades, as was formerly the practice. Similarly, in the better normal schools the training courses are specialized so that students are trained for kindergarten-primary teaching or for upper-grade teaching. (**1**)

Don't be discouraged by the unusual pictures. — Scattered through the text are about fifteen pictures illustrating certain features of the work in a very well-equipped, well-staffed private elementary school, particularly the use of sand-table construction projects and dramatic projects to vitalize the teaching of history and geography. Very commonly such pictures call forth the comment, "Oh, you can't do such work in the *public* schools." This is not always true, since some of the most progressive public schools are now so well equipped, staffed, and supervised that they are doing some of the same type of work as that shown in the pictures. For example, it is a comparatively simple matter for a public-school fourth grade to represent the seven hills of Rome in a sand-pan as shown on page 184 or for an upper grade to present the morning exercise shown in the frontispiece. The class depicted in the latter were studying the westward movement in United States history, from Daniel Boone to the settlement of the Pacific coast. During their drawing periods each pupil drew a picture representing some phase of this pioneering movement. In their regular history periods they told the class about their pictures, and then repeated the performance for the benefit of the school assembled for morning exercises. The value of such training in vitalizing history and in developing skill in graphic and oral expression is obvious. Naturally, such teaching calls for more resourcefulness and skill on the part of the teacher than does merely hearing recitations from textbooks. This fact need not discourage the beginning teacher, however, but rather encourage her to look forward to the day when, having mastered the easier routine features of teaching, she may undertake some of the more difficult tasks suggested by the pictures. In order, at this point, to get a concrete notion of some of the opportunities for such teaching, the reader might find it interesting to look at all the pictures.

Teachers' training includes subject matter, general skills, devices, principles. — The study of this book provides only a small part of the training which a teacher needs. The preparation of a teacher is a complex task and should include thorough training in each of the following:

1. The *subject matter* which she is to teach; for example, a teacher in the middle grades should have in her normal-school course a thorough study of the geography of North America and similar thorough courses dealing with the other subjects of the intermediate grades.

2. Certain *general habits and skills*; for example, a primary teacher needs to be skilled in handwriting, in blackboard drawing, in some forms of constructive work, such as weaving or modeling, in adding and subtracting numbers, and in using good English.

3. The use of hundreds of *specific devices*, such as games for teaching phonics in the primary grades, methods of teaching the use of decimal fractions in the intermediate grades, etc.

4. Understanding and applying the *general principles of method*, such as the principle that drills are made effective by securing zest and concentration of attention or the principle that new ideas must be related to a child's past experience in order that he may understand them.

This book explains principles illustrated by devices. — This book is not concerned with numbers 1 and 2 above, namely, a mastery of subject matter and general skills. It is concerned primarily with number 4, namely, the general principles of method. In order that the reader may secure a working understanding of these principles, however, it is necessary to indicate how they are actually carried out in practice. Consequently, all principles are illustrated by examples and devices, generally from real teaching situations. Skill in teaching usually involves the use of such specific devices as are noted in paragraph 3, above, but in order

that a teacher may know which devices and practices are correct and which ones are harmful it is necessary that she understand the principles of method. These principles will enable her to judge of the correctness or validity of devices which are suggested to her and may also start her on the right road to the invention of valuable original devices which she may use in her particular work.

Main topics to be discussed. — The principal topics which will be taken up are the following:

Part I. Fundamental Points of View

I. Artistic teaching.
II. The broadening purposes of elementary-school teaching, — the change from religious salvation to complete living as the aim of elementary education.
III. Economy in classroom management, — applying principles of scientific business management.
IV. Selecting subject matter, — choosing the most valuable material to meet the social needs of to-day.
V. Organizing subject matter, — avoiding meaningless encyclopedic details and organizing subjects as children learn them most readily.

Part II. Learning Processes; General Aspects

VI. How children learn — through their own responses and efforts.
VII. Building on pupils' past experiences.
VIII. Putting pupils in a favorable frame of mind.
IX. Utilizing children's active interests in order to secure concentrated attention and economy in learning.
X. Drill, — the use of ready-made scientific drill systems to secure interesting economical learning by repetition.
XI. Individual differences, — adapting class instruction to differences in capacity so that the fast pupils will not loaf or the slow ones be dragged so fast that they fail to learn.

Courtesy of The University of Chicago Elementary School

TEACHING AS A FINE ART ILLUSTRATED BY FIFTH-GRADE CONSTRUCTION PROJECT

See complete story of this picture on opposite page

The above outline does not include *all* the principles of method in teaching, but only some of the *most important general* aspects of method. There remain, moreover, many *special* methods, such as teaching children to write, to spell, to solve problems, etc., which are discussed in the author's "Types of Elementary Teaching and Learning."

Observations of teaching should supplement study of the text. — The study of this text will prove much more profitable to the students if they can observe teaching which illustrates the principles set forth and discuss the observed teaching in class. Hence it is recommended that the instructor of the course in methods of teaching arrange for the students to observe excellent lessons which illustrate the specific phases of teaching under discussion at the time.

Story of the picture on opposite page. — The castle and fortified town shown in the picture on the opposite page were constructed out of cardboard by a fifth-grade class which was studying the Feudal Age in European history. The children had read the King Arthur and other stories, as well as descriptions of the life in town and castle. On the basis of this reading, they planned an imaginary medieval town and castle as shown in the drawings on the blackboard. They then constructed the walls and buildings from cardboard coated with a preparation of flour and salt to resemble stone. Certain parts were colored with coffee, water colors, etc.

The fortified town shown on the left contained one building for each type of craftsman or merchant, — the tailor, the metal worker, the importer of baled goods, etc. In the public square was shown a medieval fair. The crowded condition of a medieval town was brought out by the narrow streets and overhanging second stories of the houses. On the right is the castle of the baron who was lord of the region. Between the town and the castle are the feudal lands, owned by the baron, and cultivated in strips according to medieval practices.

Too small to be seen in the picture is a procession of knights proceeding from the castle to the town to attend the fair. On the

blackboard in the left-center are sketches of historical costumes in which the little dolls representing the characters were dressed.

The next fifth-grade class which worked on this project constructed a *historical* castle instead of an imaginary one. They chose the castle of Kenilworth and from books of travel, encyclopedias, etc. obtained the details for its construction. Later they wrote a play centering in a visit of Queen Elizabeth to Kenilworth and the return of Drake from one of his voyages. As a piece of coöperative work in English the class wrote the following poem concerning their work:

OUR CASTLE IN THE SAND-PAN

Within our sand-pan straight and long,
We 've built an ancient castle strong;
It has some battlemented towers
That guard the lovely ladies' bowers;
A moat that 's deep and wide around,
And green grass growing on the ground.

We now have built a mighty keep,
Also a hall where knights do sleep.
We 've built a wall around the grotto
Which we have carved with Leicester's motto.

Our Kenilworth is fair and gay
With banners floating all the day,
For good Queen Bess in royal array
Is coming in her barge this day.
All loyal hearts these means employ,
To show how full they are of joy.

See reference 2 on page 11 for a description of the course of study in which these projects appeared.

The picture illustrates vitalizing and clarifying historical ideas in teaching, as well as the utilization of children's interests in romance and adventure and in manipulation. *It is introduced at this point as an example of the fine art of teaching as practiced by a teacher of thorough training, wide experience, and energetic interest in her art.*

Incidentally, notice the compact map equipment above the blackboards. About ten maps can be seen hung on rollers like those of window shades.

BIBLIOGRAPHICAL NOTES

1. JUDD, C. H., and PARKER, S. C. Standardizing State Normal Schools. *Bureau of Education Bulletin*, 1916, No. 12. Chapter IX contains a description of the policy of progressive state normal schools of organizing differentiated training courses for the teachers of primary grades, intermediate grades, and upper grades.

2. *Course of Study in Community Life, History, and Civics in the Elementary School of The University of Chicago.* Prepared by the grade teachers of the University Elementary School and printed in the *Elementary School Journal*, 1917, Vol. XVII, pp. 397–431, 485–520, 550–575, 627–649. This detailed course of study explains the subject matter and activities illustrated by a number of pictures in this text. Similar courses of study are available in geography and science.

3. *Courses of Study of the Speyer School and of the Horace Mann Elementary School.* (Teachers College, Columbia University, prices 60 and 80 cents respectively.) These detailed courses of study describe the work in two elementary schools that have had the benefit of excellent professional advice in organizing their teaching. An earlier edition of the Horace Mann course is printed in the *Teachers College Record*, 1913, Vol. XIV.

CHAPTER II

BROADENING PURPOSES OF ELEMENTARY-SCHOOL TEACHING

Main points to open each chapter. — At the beginning of each chapter will be found a brief statement of its main points. This should be read rapidly in order to get a general notion of what is to come. After the chapter is finished, it may be studied as a summary of the chapter.

Main points of the chapter. — 1. Turmoil and confusion often result in school systems because the teachers fail to understand the purposes of the classroom activities.

2. Hence a clear understanding of the aims and purposes of the elementary schools of to-day is the starting point for a discussion of methods of teaching.

3. The elementary schools of to-day train for complete living; their purposes are as broad as life itself.

4. This broad program contrasts strongly with the narrow colonial Puritan elementary schools, which trained children to avoid sin and Satan.

5. The expansion of the elementary school is due largely to three social influences: (*a*) democratic government, (*b*) practical humanitarianism, (*c*) the industrial revolution growing out of the factory system.

6. The combination of these factors is resulting in happiness of the multitudes being made the end of democratic government and of democratic education.

7. Training for happiness emphasizes health, enjoyment of leisure, good will, and social service as the social aims of the school.

8. In training each boy and each girl to attain these broader social aims, the teacher develops in them valuable information, habits, ideals, and many-sided abiding interests.

Necessary for teachers to understand purposes of school activities. — It is highly important that teachers understand the aims, purposes, and values of the activities which they supervise in school. Unless they do understand the purposes of all parts of their teaching, time and energy and public funds will often be wasted on activities that have little value. The possibilities of such waste are illustrated by the following observations.

Turmoil over purposes of handwork. — About 1900 an observer visited a very backward school system in which a new superintendent was trying to introduce many innovations. These innovations had been described to the teachers in their institute week at the opening of the school year, but the teachers had secured little comprehension of their purposes. One of the innovations was handwork. Two fourth-grade rooms were visited in which this new activity was being taught.

Basket factory versus "busy" work. — In one of these rooms the teacher was having the children weave wicker baskets. She was very enthusiastic about their work. She said they made baskets at recess and after school, and even worked on them at home. Finished baskets were hanging all around the room, and she proudly showed the observer a closet full of them. The room was *a veritable basket factory*. The observer asked her if the basket-making had any connection with the other subjects, but she said it did not; basket-making, she considered, thoroughly justified itself.

In the other fourth-grade room just the opposite situation prevailed. The class was divided into two sections. The study section was quietly weaving flexible splints into little mats. At the end of the period they *took the mats to pieces* and replaced the splints where they belonged. This teacher was also enthusiastic about the new activity; it was so useful as "busy work," she said, to keep the children out of mischief.

Courtesy of The University of Chicago Elementary School

HANDWORK USED AS AN AID IN THE STUDY OF INDUSTRIES, GEOGRAPHY, AND HISTORY

See the story of this picture on opposite page

Frills versus fundamentals. — Many of the parents, however, did not view the handwork with favor. They complained that the three R's were being sadly neglected in favor of the new "fads and frills." The children, they said, now spent their time at home cutting paper dolls and pasting paper stars instead of studying "the fundamentals." Eventually the turmoil of misunderstanding became so great that the superintendent moved to other fields. Possibly he succeeded there in getting his teachers to understand that the purpose of the handwork was to aid in the study of community life

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Story of the picture on opposite page. — Spinning and weaving have always been among the most important of human industries. To understand them is an important factor in understanding human needs and corresponding industrial processes. They may be made clear to children by beginning with the simpler mechanical devices, some of which the children may use themselves. In the picture on the opposite page are grouped illustrative materials and processes used in a second-grade class which was following the course of study in history described on page 135. On the wall is hung a sheepskin, from which the children acquired real ideas of wool in the natural state. At the left are two children who are trying to comb, or card, some wool with a couple of primitive carding-paddles containing pegs, or pins, or thorns. To the right of the old woman is a child trying to twirl a simple spinning device to twist cotton into threads. At the extreme right, a child is weaving a little rug on a lap loom. All the materials, devices, and processes described so far could be provided in a well-equipped public school.

The central figure in the picture, however, — the old Italian woman spinning flax on her own spinning wheel, — could seldom be reproduced even under the most favorable circumstances. She was "found" at Hull House, one of Chicago's great social settlements, where many European immigrants congregate and bring their primitive industrial and artistic processes. To see her at work was a valuable educative experience for these children.

Courtesy of The University of Chicago Elementary School

WHAT EDUCATIONAL PURPOSES ARE ATTAINED BY THESE KINDERGARTEN CHILDREN PLAYING HOUSE?

See story on opposite page and discussion on page 18

in connection with geography and history, and that it should be taught in such a way as to serve this purpose.

Even purposes of three R's need careful defining. — In the above incident the complacency of the parents concerning the values of the three R's suggests that there is more common agreement about the purposes of teaching reading, writing, and arithmetic than in the case of handwork. A careful analysis, however, of the teaching of these well-established and valuable subjects shows that teachers are often wasting much time and energy in activities that have little value in the world at large. This fact will be brought out in detail later.

Kindergarten illustrates relating activities to larger purposes. — The fact that fourth-grade handwork should be related to the purposes in studying geography and history, and the necessity of evaluating the three R's in relation to the activities of the world at large, are examples of the necessity of having teachers comprehend the larger aims and purposes of teaching in order that they may determine the values of each activity which they supervise. A good example of this process of evaluating specific schoolroom

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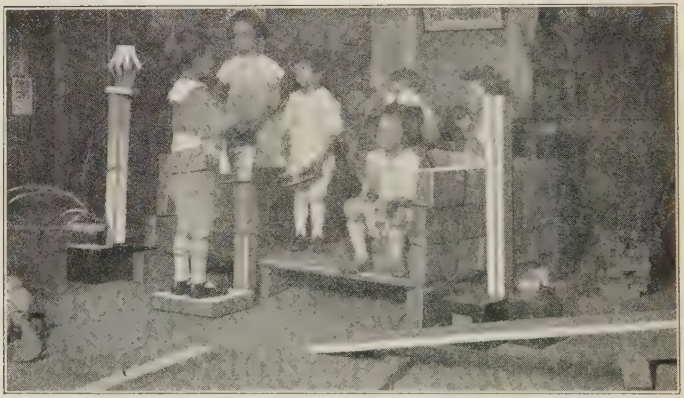
Story of the picture on opposite page. — The little kindergarten group shown at lunch on the opposite page illustrates the use of certain modern kindergarten materials and projects. In the background is the large five-part folding screen with a door and curtained windows, used to construct a playhouse as described on page 126. To the left of the door, but scarcely visible in the picture, is a sideboard made by the children from large blocks. These large blocks appear more clearly in the little chairs upon which the children are seated. The planning, discussing, and carrying out of the activities suggested in this picture give the children training in problem solving, oral expression, coöperation, and manual construction, as well as helping them to comprehend better the activities of their homes.

activities in terms of the larger purposes of education is found in the work of kindergarten teachers.

An ordinary observer in a modern kindergarten may see the children engaged in such activities as are pictured on pages 16 and 18. To such an observer the children seem to be merely playing — playing house, playing store, playing with dolls, running, skipping, dancing, singing, etc. The



KINDERGARTEN PLAY PROJECT — BAND AND BANDSTAND

From The University of Chicago Elementary School. Are these children merely having a good time or are they attaining some of the educational aims described below?

kindergartner, however, will tell you that while it is merely play for the children, they are being trained in "community life, industrial and fine arts, language, music, physical education, nature study, and number work." She may tell you that the purposes of the play activities are represented in the following impressive terms:

1. *Social or moral purposes:* for example, teaching non-interference with other children; self-control, as in keeping quiet when someone else is speaking; order, as in putting the doll's clothes away; working for some definite end, as

in procuring the seeds and preparing the soil for planting; obedience, as in following promptly the teacher's directions.

2. *Training in reflective thinking, in problem solving:* for example, in devising by experimental folding a paper basket that will hold the seeds that are to be planted; in devising a slanting roof to be built on a toy barn; in devising a bridge of blocks to cross an imaginary stream that has been marked with chalk on the floor; in choosing colors for various decorative purposes, etc.

3. *Training in expression:* for example, in drawing and coloring when the children use colored crayons to represent a flowering plant; in oral expression, when they tell about their toys at home or their trip to the grocery store.

4. *Training in æsthetic enjoyment:* for example, in fundamental rhythms, as in clapping, skipping, and dancing; also in music, drawing, painting, designing, and story-telling.

5. *Training in manual skill:* for example, in piling blocks, in cutting with scissors, in modeling with plasticine, in throwing and catching a ball.

Historical changes in purposes. *From religion to complete living.* — The examples given above are intended to illustrate what is meant by understanding the aims and purposes of elementary teaching, and the practical bearing of this understanding. We shall now secure further insight into the matter by an examination of the aims and purposes of elementary schools as these have changed in America since the settlement by the Puritans in New England, about 1640. The diagram on page 20 summarizes the remarkable changes which we shall describe.

This diagram suggests the enormous expansion which has taken place in elementary-school purposes and gives the title to this chapter. In the early colonial period, in nearly all elementary schools, practically the sole purpose of teaching was religious salvation. In contrast with this narrow conception the purposes in American public schools

at the present time have become as broad as life itself, excepting only religion.

Colonial purposes. *Massachusetts law to circumvent Satan, 1647.* — The general statement about the dominant religious purpose in colonial elementary schools may be illustrated by the following quotation from the Massachusetts law of 1647. To appreciate this quotation try to imagine a state legislature at the present time phrasing a law in the same fashion. The preamble began as follows:

> It being one chief point of that old deluder, Satan, to keep men from a knowledge of the Scriptures, as in former times, by keeping them in an unknown tongue, so in these latter times, by persuading from the use of tongues, that so at last the true sense and meaning of the original might be clouded by false glosses of saint-seeming deceivers, that learning might not be buried in the grave of our fathers in church and commonwealth, the Lord assisting our endeavors, It is therefore ordered that every township in this jurisdiction, after the Lord has increased them to the number of fifty householders, shall then forthwith appoint one within their town to teach all such children as shall resort to him to write and read, etc. (**7**: 60)

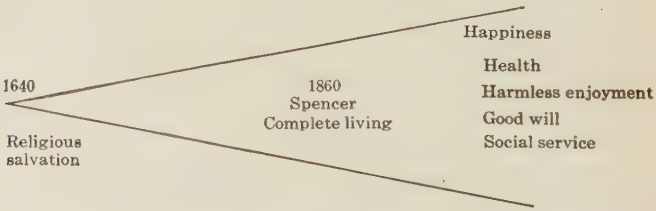
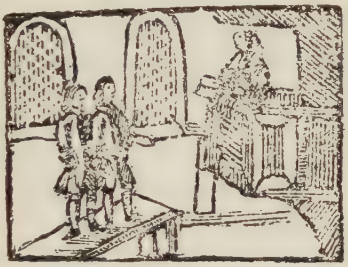


DIAGRAM OF BROADENING PURPOSES IN ELEMENTARY EDUCATION

Sin and Satan pondered by children in the "New England Primer." — It is apparent from this law that the "old deluder, Satan," was a very real personage to the New England Puritans and that elementary schools were considered an important weapon in beating him. The little children in school were

daily impressed with the dangers of hell and the devil in their study of the "New England Primer." The sample page from the Primer which is reproduced in the accompanying picture shows the children offering their "Praise to God for learning to Read . . . His holy Word," because it taught each that he was a "slave to sin" and made him wonder whither could "a sinner flee to save himself from Hell." The "New England Primer" was the universal book for beginners in reading in the colonial schools of New England. Similar primers were used in other colonies. After the primers had been mastered, pupils proceeded to read in the Bible. In the early colonial schools down to about 1750 practically all of the reading matter was of a religious nature. Hardly anything else was taught in the elementary schools except arithmetic, and that only in the larger towns.



Praiſe to GOD for learning to Read.

THE Praiſes of my Tongue
I offer to the LORD,
That I was taught and learnt ſo young
To read his holy Word.

2 That I was brought to know
The Danger I was in,
By Nature and by Practice too
A wretched ſlave to Sin.

3 That I was led to ſee
I can do nothing well;
And whether ſhall a Sinner flee
To ſave himſelf from Hell.

SAMPLE PAGE FROM THE "NEW ENGLAND PRIMER," ILLUSTRATING THE DOMINANT OTHER-WORLDLY RELIGIOUS AIMS OF COLONIAL PURITAN EDUCATION

Social changes since colonial period. — To comprehend the change from this narrow conception of elementary

education to the broad idea of training for "complete living," as emphasized by Spencer about 1860, it is necessary to consider the enormous social changes which had taken place in the meantime. We shall discuss three of these social developments or changes under the following headings: democratic government, practical humanitarianism, and industrial interdependence growing out of the factory system.

Democratic government. *Without education it becomes a farce or a tragedy.*—The organization of the American government as a republic following the Revolutionary War had far-reaching influences upon elementary education. The fact that governmental affairs were now in the hands of representatives elected at short intervals by the people made it very important that all citizens be trained to understand the duties and problems of citizenship. This fact is well expressed by James Madison, the fourth president, in the following words:

> A popular government without popular information or the means of acquiring it, is but a prologue to a farce or a tragedy, or perhaps both. . . . The best service that can be rendered to a country next to giving it liberty, is in diffusing the mental improvement equally essential to the preservation and enjoyment of that blessing. (**7**: 133)

Training for political citizenship not an empty phrase.—Too often the phrase "training for citizenship" is spoken glibly without serious comprehension of its significance in the actual life of our country. It is well to read the first sentence in Madison's statement and then apply it to the reign of the Bolsheviki in the Russian Revolution of 1917–1918 to understand what a terrible "farce" or "tragedy" a republic may become in the hands of mistaken or unscrupulous leaders of an uneducated and largely illiterate people. Training in reading and in the independent study and evaluation of printed discussions of social issues is one of the fundamental bases of enlightened, democratic citizenship. Just as soon as our republic was established, this fact

was appreciated. As a consequence political orations were inserted in the school readers, and accounts of the history and geography of the country began to be written and gradually found their way into elementary schools.

Democratic government and education to benefit the people. — Not only does democratic government necessitate an education which trains for enlightened citizenship but it demands also an education which will *benefit* the people, the masses of citizens, in all possible ways. This becomes clear when we think of a democracy in Lincoln's terms as a "government of the people, by the people, *for* the people." A government *for* the people is one that does all it can *for* the people. Since the public schools of a democracy are merely a part of the government, their purpose also is to serve and benefit the people in all possible ways.

Practical humanitarians attack social evils including educational neglect, slavery, juvenile criminality, and poverty. — The problem of helping and benefiting people was attacked during the nineteenth century not only by democratic governments, however, but also by practical humanitarians working as individuals or organizations, often in coöperation with the government. To help the unfortunate classes, humanitarians in England and America attacked especially, during that century, the following evils: slavery, juvenile criminality, poverty in the large cities, child labor, and the lack of primary education. Slavery in the English colonies was abolished by an act of Parliament of 1833. Lincoln's abhorrence of slavery and his abolition of it in this country are familiar to all. Juvenile criminality and poverty in the large cities was attacked in America early in the century. In 1800 the population of the five largest cities was as follows:

Philadelphia, 69,403
New York, 60,489
Baltimore, 26,114
Boston, 24,937
Charleston, 20,473

In these cities existed concentrated ignorance, vagrancy, pauperism, vice, and crime. Public-spirited citizens who were concerned about the degraded condition of the lower classes in the cities organized societies to study and improve it. Thus, in New York City there was organized in 1817 the Society for the Prevention of Pauperism. This society undertook the establishment of a savings bank, an apprentice's library, and other enterprises. Defects in the penitentiary system were attacked, especially the confining of vagrant children with hardened criminals. A private subscription of $17,000 was raised for the founding of a House of Refuge for Juvenile Delinquents, which was established in 1824, the first of its kind in the United States.

Private philanthropy established free schools of New York City. — The same peculiar problems of city life were uppermost in the minds of citizens who established the first free schools on a large scale in New York City. Owing to the fact that no public schools existed in this city of 75,000 people in 1805, a private philanthropic society undertook extensive provisions for free education. Speaking of the social needs of the city's poor at that time De Witt Clinton said:

> A number of benevolent citizens had seen, with concern, the increasing vices of the city, arising, in a great degree, from the neglected education of the poor. Great cities are, at all times, the nurseries and hotbeds of crime. Bad men from all quarters repair to them, in order to obtain the benefit of concealment, and to enjoy in a superior degree the advantages of rapine and fraud. . . . The mendicant parent bequeaths his squalid poverty to his offspring, and the hardened thief transmits a legacy of infamy to his unfortunate and depraved descendants. . . . In this state of turpitude and idleness, leading lives of roving mendicancy and petty depredation [these children existed] a burden and disgrace to the community. (**7**: 265)

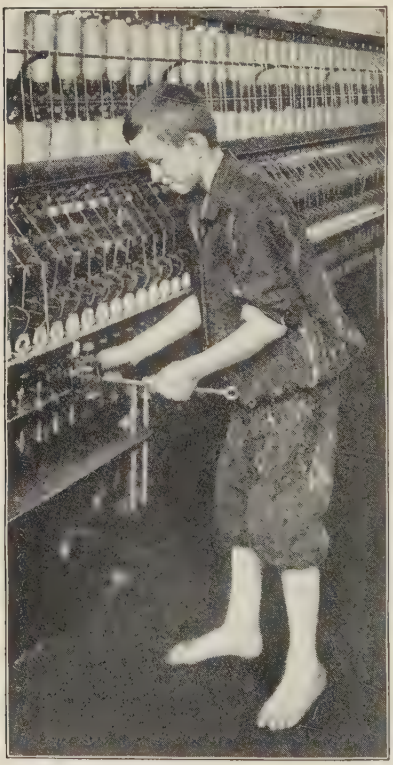
Child labor attacked by English humanitarians, 1833. — The efforts of humanitarians to benefit the masses of people,

particularly children, is further illustrated by the restriction of child labor in England. The following account of this action is given by Hazen following his story of the English abolition of slavery in 1833.

Conscience was aroused at the same time by a cruel evil right at home, the employment, under barbarous conditions, of children in factories. The employment of child labor in British industries was one of the results of the rise of the modern factory system. It was early seen that much of the work done by machinery could be carried on by children, and as their labor was cheaper than that of adults, they were swept into the factories in larger and larger numbers, and a monstrous evil grew up. They were, of course, the children of the poorest people. Many began this life of misery at the age of five or six, more at the age of eight or nine. Incredible as it may seem, they were often compelled to work twelve or fourteen hours a day. Half-hour intervals were allowed for meals, but by a refinement of cruelty they were expected to clean the machinery at such times. Falling asleep at their work they were beaten by overseers or injured by falling against the machinery. In this inhuman régime there was no time or strength left for education or recreation or healthy development of any kind. The moral atmosphere in which the children worked was harmful in the extreme. Physically, intellectually, morally, the result could only be stunted human beings.

This monstrous system was defended by political economists, manufacturers, and statesmen in the name of individual liberty, in whose name, moreover, crimes have often been committed, the liberty of the manufacturer to conduct his business without interference from outside, the liberty of the laborer to sell his labor under whatever conditions he may be disposed or, as might more properly be said, compelled to accept. A Parliament, however, which had been so sensitive to the wrongs of negro slaves in Jamaica, could not be indifferent to the fate of English children. Thus the long efforts of many English humanitarians, Robert Owen, Thomas Sadler, Fielden, Lord Ashley, resulted in a passage of the Factory Act of 1833, which prohibited the employment in spinning and weaving factories of children under nine, made a maximum

eight-hour day for those nine to thirteen, and of twelve for those from thirteen to eighteen. This was a very modest beginning, yet it represented a very great advance on the preceding policy of England. It was the first of a series of acts regulating the conditions of laborers in the interests of society as a whole, acts which have become more numerous, more minute, and more drastic from 1833 to the present day. The idea that an employer may conduct his business entirely as he likes has no standing in modern English law. (6: 441–442)



BOY WORKING IN A COTTON FACTORY

Contrast (1) the mechanical perfection and enormous economy of human energy represented by the machinery with (2) the waste of human development represented by the uneducated boy wearing his life away in the "maddening racket of the machinery"

Nine years later Parliament passed similar legislation regulating the employment of women and children in mines. Speaking of this action Hazen says:

One of the most famous parliamentary reports of the nineteenth century was that of a commission appointed to investigate the conditions in mines. Published in 1842, its amazing revelations revolted public opinion and led to quick action. It showed that children of five, six, seven years of age were employed underground in coal mines, girls as well as boys; that women as well as men labored under conditions fatal to health and morals; that

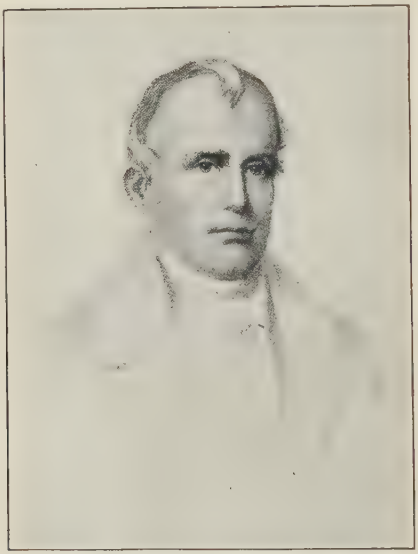
the hours were long, twelve or fourteen a day, and the dangers great. They were veritable beasts of burden, dragging and pushing carts on hands and knees along narrow and low passageways, in which it was impossible to stand erect. Girls of eight or ten carried heavy buckets of coal on their backs up steep ladders many times a day. The revelations were so astounding and sickening that a law was passed in 1842 which forbade the employment of women and girls in mines, and which permitted the employment of boys of ten for only three days a week. (**6**: 449)

Broadening elementary education thus rests on broad humanitarian social basis. — These quotations concerning English child-labor legislation put us into the social atmosphere of humanitarian effort of the nineteenth century. They help us to view the *educational* efforts of these same humanitarians as merely one phase of a broad social movement for improving the condition of the masses of the people. They help us to realize the broad basis for social improvement upon which the movement for a broader elementary education rests. In contrast with the narrow otherworldly aim of the Puritans, which resulted merely in training children to read the Bible in order to avoid *future* damnation, we see modern humanitarians concerning themselves very vitally with the *present* happiness and development of children for the benefit of society as a whole.

Humanitarianism coöperates with democracy to benefit the masses through broader education. — Thus we find two powerful lines of influence coöperating to broaden the scope of elementary education; namely, democratic government, *by* the people and *for* the people, and practical humanitarianism, which endeavors to improve the lot of the multitudes in all possible ways.

Industrial revolution. *Increases social interdependence and gives power to organized labor.* — The third influence which we shall note in the broadening of the purposes of elementary schools is the development of the factory system.

The sum total of industrial changes resulting during the nineteenth century from the factory system is known as the Industrial Revolution. We shall emphasize here merely two features of this revolution: first, the increasing interdependence of people and the consequent necessity of organizing a broader elementary education to prepare for this interdependence, and, second, the increasing power of organized labor, which, in its influence, coöperates with democracy and humanitarianism to make elementary education benefit people to the fullest degree.



SAMUEL SLATER

The cotton factory erected by him in Rhode Island in 1790 marks the birth year of the factory system in America. See page 29

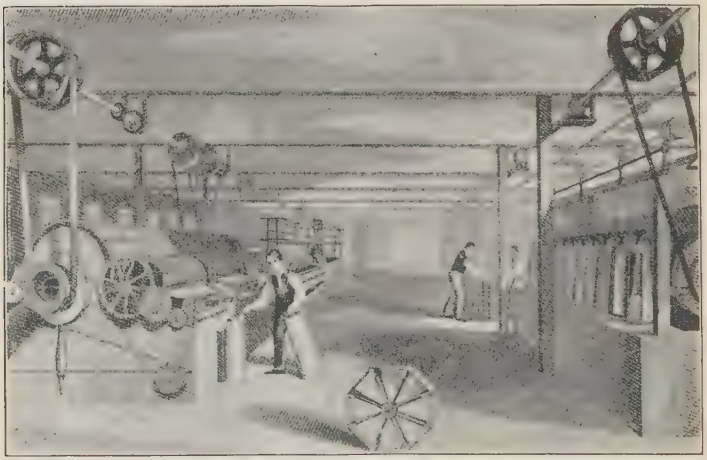
The history of the factory system.—The factory system and the Industrial Revolution grew out of the extensive use of automatic power machinery in manufacturing. It began in England with the invention of automatic machinery for spinning and weaving (1770–1790). At first this was driven by water power and tended to develop manufacturing centers near waterfalls. Very soon the invention of the steam engine made it possible to locate factories wherever coal could be transported conveniently. As a consequence textile factories developed very rapidly (1792–1830) and resulted in the growth of many large manufacturing cities. The corresponding development of textile factories

in America and their effect on home industries is concretely set forth by Tryon in the following paragraphs:

While spinning machinery was used in Philadelphia as early as 1775 and the common jenny and stock card were in operation in various parts of the country before 1790, yet this latter date is generally accepted as the birth year of the factory system in the United States. It was in this year that Samuel Slater erected at Pawtucket, Rhode Island, a cotton factory, which was supplied with spinning machinery on the English plan. Soon after the success of this mill had been demonstrated, others were erected in New England and throughout other sections of the country as well. These mills spun yarn and thread for distribution to the families of the neighborhood to be woven into the cloth they needed for themselves or which they desired to sell. If there chanced to be no mill in the neighborhood, a supply could be secured at the store in exchange for cotton, wool, and other farm products. The yarn was not expensive and it proved a great convenience to the housewives, since its use enormously diminished their labors. Spinning mills became so common throughout the country that it is proper to speak of a mill stage in connection with the rise of textile manufactures in any given section. The New England and middle states passed through such a stage between 1790 and 1820, the Southern states between 1812 and 1830, and the Ohio Valley states between 1830 and 1860.

The completion of the textile-manufacturing system came with the introduction of the power loom. This important event happened in 1815, at Waltham, Massachusetts, thirty years after its invention by Cartwright. While there had been factories run entirely independently of the homes before this date, yet the introduction of such a tremendous time- and labor-saver, in the matter of cloth-weaving, ushered in a period of independence never before known. The establishments could now individually employ all the various processes in the manufacture of cloth, from the receipt of the raw material to the production of the finished web. Thus the factory system proper came into existence in this country. While it had a hard time during the decade from 1815 to 1825 on account of foreign competition, lack of capital, inferior machinery,

lack of skilled labor, and a coarse quality of raw materials, yet at the same time by 1830 the system was sufficiently established in New England, the middle states, and certain centers in the West to assure a future independence of foreign manufactures for the various fabrics in domestic use, and to relieve the housewives of a great deal of the strenuous labor which their foremothers had been obliged to perform. For when the price of the ordinary brown



ENGLISH MACHINERY FOR CARDING, DRAWING, ROVING, AND SPINNING AS INTRODUCED IN AMERICA BY SAMUEL SLATER IN 1790

Contrast the mechanical economy of this factory with the slow hand processes shown in the picture on page 14

shirting was reduced from 42 to 7½ cents a yard between 1815 and 1830, there was little inducement for one to labor all day at the loom to weave four yards of such cloth. The housewives could no longer compete against a system which made it possible for one man tending three or four power looms to turn out from 90 to 160 yards a day. (**8**: 274–276)

Contrast colonial home-industry situation and modern industrial society.—The final sentences of the above quotation illustrate two striking features of the factory system:

first, its *economy*, which has resulted in greatly reducing the labor of human beings and in increasing their leisure; second, the *dependence* of people upon others for supplying most of their needs. Consequently we find the strongest contrast between life in the city homes of the present day and life in the rural homes of colonial New England before the Industrial Revolution. In these rural homes boys and girls secured a many-sided industrial and social training for meeting their own needs for food, clothing, and shelter. They were busy most of the time. In the cities to-day the children, particularly the boys, have little to do in the homes; they are dependent upon many agencies far and near for their food, clothing, and shelter, and they have much leisure time to employ in devious ways.

Education for industrial interdependence and for leisure. — Consequently the task of the school in training children for complete living is correspondingly increased. It includes not only training for enlightened democratic political citizenship but also training for a broad understanding of our interdependent industrial life and for the harmless enjoyment of the increased social leisure which the economies of the factory system have created.

Interdependent industrial society gives power to organized labor. — This interdependence and leisure is being emphasized by a by-product of the Industrial Revolution, namely, organized labor, the power of which is constantly increasing. The fundamental social cause of the increasing power of organized labor is the *intricate interdependence* resulting from the specialization of industry and the division of labor. City dwellers are entirely dependent on the labor of distant farmers for their food and of distant miners for the coal which heats their homes and furnishes power for their industries. Hence, if the miners strike for a long time, millions of persons must go heatless and workless. Perhaps the most effective example of this interdependence of people at the

present time, and the resulting power of organized labor, is found in the railroads. If the railroads stop running for a long time people will not only go heatless and workless but many will starve. The organized railway workers appreciate their strategic social position and often make use of it to improve their lot.

Organized labor aims to increase wages, leisure, and happiness of workers. — Whatever may be the ultimate outcome of the social power of organized labor, the historical fact is that this power is continually being used to increase the profits of labor from industry and to reduce the hours of labor, thus resulting in increased leisure time for the workman. The ultimate social benefit for which the conscientious unions seem to be striving is increased happiness for their members. As organized labor secures political power, it tends to use this for the same purpose as it does its union power — namely, to increase the happiness of its members. These efforts have often resembled in purpose the efforts of humanitarians as illustrated in the English legislation concerning child labor described above, on page 25. In America examples of legislation influenced by labor interests are found in the eight-hour law for national employees and the state enactments for insurance against accidents in factories. In all this legislation the increased happiness of the individuals concerned stands out: the right of the worker to leisure and means of enjoying it, the right of children to develop fully, the right of the injured to maintenance. Thus "the pursuit of happiness" appears not merely as one of the "inalienable rights" of mankind but also as one of the most prominent aims of positive governmental action.

Increasing happiness of multitudes becomes the aim of democratic education. — We have now reached the final point in our story of the social changes which have resulted from the combination of democratic government, humanitarianism, and the factory system. In this story we brought out the

prominent part played by each of these factors in the social development since the American Revolution. Enlightened democratic government *for* the people, humanitarian efforts resulting in legislation for the *benefit* of the masses, and the use of the power of organized labor to increase the benefits from the State for the people, all tend to emphasize the importance of the *government as an agency for increasing the happiness of the multitudes of peoples*. It follows naturally from this fact that public democratic education, which is but one of the functions of democratic government, also tends to emphasize as its aim increasing the sum total of happiness of individuals. *Increasing human happiness in this world* thus becomes the broad, inclusive educational aim under which we can group the greatly expanded purposes of education which have replaced the narrow, other-worldly, religious aims of the New England Puritans. The Puritans said there are small chances for happiness even in the next world: hell and the devil are waiting to receive untold millions; only by denying yourself the pleasures of this life can you have a chance for happiness in the next; therefore there is no time to pursue happiness here. In contrast American democratic schools are prohibited from teaching religion; hence they cannot focus their attention on the future world, but must prepare definitely for this one. In this preparation their attention is focused upon the training of all individuals so as to increase the sum total of happiness of all individuals in this world.

Happiness aim for multitudes makes "training for the State" concrete. — Thus far we have noticed two general facts concerning the happiness aim: first, it contrasts strongly with the "other-worldly" aim of the Puritans; second, it unites the efforts of democracy, humanitarianism, and organized labor. A third point to notice is that it is a guide to deciding what we mean by "training for service to the State." "The State" is a very abstract term, and I

must confess I have often wondered just what it means. During the period of despotism in France Louis XIV (r. 1643–1715) is reported to have said, "The State? I am the State." Very commonly the State has been thought of as being the same as the government. Recently, however, an eminent sociologist[1] said:

> A state is essentially like any other human group, a bridge club, a philharmonic society, a merchandising firm, a banking corporation, a charity organization, a religious community, a counterfeiters' gang, an artists' guild — a state is a company of persons behaving themselves in a certain way.

These uncertainties concerning the meaning of "the State" make it undesirable to phrase our educational aims in terms of such a vague abstraction. It is far better to think of them in terms of the more concrete objects of education, namely, the individuals whom we teach and their lives in school and after graduation. We have noted that democracy, humanitarians, and organized labor have focused their attention on the happiness of these concrete individuals. We have set up their happiness as the aim of education. We shall now endeavor to find out what we mean by their happiness.

Happiness, — the experience which we desire for those dear to us. — Like the term "state," happiness is an abstract idea that is difficult to define; hence we shall not try to define it. We shall content ourselves with suggesting that happiness is that type of experience which most of us desire for our mothers and fathers, our sisters and brothers, our children — in general, for those who are dear to us. With this idea as our starting point we can begin to work back toward some of the more concrete ideas about teaching with which the chapter opened. Our first step will be

[1] Albion W. Small, "Americans and the World Crises," *American Journal of Sociology*, September, 1917, Vol. XXIII, p. 171.

to determine what are the things that loom large in achieving the happiness of those that are dear to us and of individuals in general. The most prominent of these factors are shown in the following paragraph.

Broad social aims of teaching. — The main factors in happiness may be regarded as the broad social aims of teaching and outlined as follows:

1. Good health
2. Harmless enjoyment of leisure time
3. Good will
4. Social service
   a. Business service
   b. Home service
   c. Civic service

We shall now take up each of the above aims for consideration.

Good health. *Of universal interest irrespective of wealth or position.* — The importance attached to good health in ordinary life is suggested by the common form of greeting, "How do you do? how are all the folks?" Not only is health the *first* topic of conversation with many persons but often it is the *only* topic. Having ascertained from one person the facts concerning health, you walk on until you meet your next friend, and repeat the same ritual with him. It would be hard to find any topic that receives so much thought and consideration. It concerns both rich and poor. In this respect it probably presents a more prevailing problem than unemployment, for while three fourths of the workers in America probably have rather steady employment, the uncertainties of health are presented to practically everybody.

Distress from sickness popularizes physicians, patent medicines, and mental healing. — Regarded from the happiness standpoint, it is obvious that ill health is the cause of enormous distress and suffering. This distress

extends not only to the patient but also causes great mental distress to parents and other relatives. Loss of position or money often follows ill health, thus adding to its train of distresses. As a consequence, there is enormous social

Courtesy of the Rockefeller Foundation

AN OBJECT LESSON IN HEALTH INSTRUCTION. A SIXTEEN-YEAR OLD GIRL BEFORE AND AFTER TREATMENT FOR THE HOOKWORM DISEASE

See "The Rural School and the Hookworm Disease," by W. A. Ferrell. *Bulletin No. 20 of the United States Bureau of Education*, 1914

striving for good health, and physicians, patent medicines, and cults for mental healing secure a large following.

Scientific studies of health consume much thought and energy. — As a subject for scientific study, health takes high rank. There is enormous expenditure of human thought and energy in scientific researches concerning it.

Courtesy of the Rockefeller Foundation

INTERNATIONAL, SCIENTIFIC, MISSIONARY HEALTH ACTIVITIES OF THE ROCKEFELLER FOUNDATION

A corresponding map for Asia and Australia depicts similar activities of the "International Health Board" of the Foundation in its efforts to "promote the well-being of mankind throughout the world." (See page 38)

The amount of health investigation that is carried on in the laboratories of great universities is incomprehensible to most persons; for example, The University of Chicago, already equipped with several large laboratory buildings in which instruction and investigations are carried on in anatomy, physiology, bacteriology, and medicine, recently received several million dollars for erecting further medical and hospital buildings and for maintaining research studies in health.

Scientific-health missionaries improve national health.— An impressive example of the enormous social importance of health is found in the work of the Rockefeller Foundation with its endowment of $100,000,000 to promote the "well-being of mankind throughout the world." Improving public health in many parts of the world has been the most prominent feature of the work of the Foundation. The attack on the *hookworm* disease is a striking example. In 1917 this attack was being carried on in twenty-five foreign countries and twelve American states. The hookworm is an intestinal parasite which saps enormously the energy of the patient. See the picture on page 36. The enormous loss of social energy from the hookworm disease is shown by the fact that in one region in China where the Foundation is at work, about eighty-five per cent of the mining and agricultural coolies were infected. Yet with proper sanitary devices and instruction the disease in any neighborhood can be eradicated. *Malaria* is another socially wasteful disease that the Foundation is seeking to eradicate in the South through drainage and screening to avoid the malarial-breeding mosquito and through curing the infected persons. In an Arkansas town where the efforts centered in exterminating the mosquito by proper drainage, *the number of doctor's calls* for malaria *fell from six hundred* in October, 1915, *to fourteen* in the same month in 1917. *Tuberculosis* in France has also been attacked by the Foundation, as illustrated in the poster on page 39.

Courtesy of the Rockefeller Foundation

PUBLIC INSTRUCTION CONCERNING TUBERCULOSIS ILLUSTRATED BY POSTER USED BY ROCKEFELLER FOUNDATION IN FRANCE

Try your French on this poster. If you don't read French, notice how much you can decipher through similarity of English words — combat, allies, enemies, ravages, precautions, etc.

Ignorance and superstition of laity contrast with scientific studies of health. — Yet with all this scientific effort and achievement many persons who merely go through the elementary schools remain in a state of ignorance and superstition concerning health. For example, at one extreme we find the lady whom I heard the other day complaining, "I have just *taken everything*, and nothing does me any good"; while at the opposite extreme are those who deny that there is any such thing as ill health and refuse to "take" anything or do anything but think. Even such a common object as the clinical thermometer, which physicians use to ascertain the temperature of patients, is a weird and uncomprehended thing to most of the laity, yet its use is simplicity personified compared to the intricacies of an automobile or a typewriter.

Learn by reading some nontechnical discussions of health. – Sufficient has been said to demonstrate the importance of the health aim in human happiness. The reason for saying so much was the necessity of making teachers realize its importance as compared with other educational aims. In order that you may start to replace common superstition and ignorance with simple scientific facts about health, I suggest that you read the book entitled "How to Live," written by Fisher and Fiske and published by Funk and Wagnalls under the auspices of the American Life Extension Institute. The latter is a national organization for improving American health. Its head is ex-President Taft. If you will write it for a catalogue of its publications you will be placed in touch with much health literature and information which will benefit you and your pupils. Address The Life Extension Institute, New York City.

Health work in schools: inspection, relief, instruction. — As a consequence of the increased appreciation by social leaders of the importance of health as a factor in human welfare and happiness, public provision for health work in

Courtesy of the Elizabeth McCormick Memorial Fund, Chicago

THE OPEN-AIR SMILE

Illustrating care of tubercular children in open-air schools. Compare the autobiography of another open-air pupil on page 42

schools has made enormous progress in recent years. Most large school systems now provide for periodical inspection of the pupils by school physicians, dentists, and nurses; for free treatment of special defects of poor children, such as defective teeth or tonsils; for improved training in health knowledge and health behavior.

One of the most unique features of such health work in public schools is the maintenance of open-air schools for tubercular children. The following story was written by such a child for the *Open-Air Smile*, a monthly periodical started by the children of the Chicago open-air schools.

I was born in a little gray house in a little country town near the city of Kiev. When I was two years old my downfall began. First I fell sick and had the scarlet fever, and as soon as I was cured of that I caught diphtheria, and after I was cured of that I caught pneumonia. I stayed in bed for a year and I never got out of bed for that long time. When I was six years old I came to America to the city of Chicago. Everybody had told us in Russia that gold was lying everywhere in the streets. I started to go to school at the Garfield School. Later we moved to a different street, so I took a transfer to the Langland School, and later on we moved again, and then I came to the Goodrich School, which I attended a couple of years. When I was finally in the seventh grade I was sent out to Winfield tuberculosis camp. I stayed there six months because I was charged with having tuberculosis. Those six months passed away so quickly that it seemed like six weeks. I think it was the happiest time of my life staying out there. When I went home hardly anybody recognized me, because I was not the sick little fellow that I was when I went to Winfield, but a big, strong, and healthy boy with cheeks like roses. Later on I was put in the Foster open-air room, where I am now in the eighth grade. (**11**)

Harmless enjoyment of leisure time. *Easily explained by increased leisure in modern industrial society.* — Our second purpose in an education which aims to increase human happiness is training for harmless enjoyment. This would need

almost as elaborate a discussion as health, had we not already presented on pages 27–32 the historical facts about modern industrial society. There it was shown that the leisure of the city youth presents a serious problem to the school and that humanitarians and labor organizations have so reduced the hours of labor that leisure is occupying an increasingly large part of the time of ordinary adults. As a consequence enjoyment of leisure becomes a large factor in life. While Puritanical-minded persons might regard such an aim as reprehensible, it is obvious that when we consider the happiness of those dear to us we place a large value on their enjoyment of leisure activities. For many persons, during the winter months, reading, music, and the drama furnish their leisure pursuits. As they become better educated, thinking about and discussing problems of the day enter in. During warm weather outdoor activities play a large part with certain classes. As a rule these lines of enjoyment are harmless. There are many persons, however, particularly youths, who spend their leisure in activities that are positively harmful to themselves and to others. The problems of training all persons for harmless enjoyment which are suggested by these facts are being given serious consideration by the greatest social workers of America. For example, Jane Addams of the Hull House Social Settlement, Chicago, is quoted as saying:

> We have no [adequate] sense of responsibility in regard to the pleasures of young people, and continually forget that amusement is stronger than vice and it alone can stifle the lust for it. We see all about us much vice which is merely a love for pleasure "gone wrong" — the illicit expression of what might have been not only normal and recreative pleasure but an instrument in the advance of higher social morality.

In progressive elementary schools, beginning in the kindergarten and continuing throughout the grades, training for harmless recreation is being provided in many forms, —

in rhythmic activities, in plays and games, in unison singing of lilting, haunting melodies, in dramatic activities, and in wide reading "just for fun."

Good will. *Long emphasized by churches and moral leaders.* — Our third broad social aim, namely, good will, needs little discussion because most readers have heard it emphasized frequently in church or in school. Selfishness, which is the opposite of good will, is one of the chief hindrances in increasing the happiness of the multitudes. In order to increase happiness in general each individual needs to be trained (1) not to interfere with the happiness of other well-intentioned, well-behaved persons, (2) to wish others well, and (3) positively to endeavor to increase the happiness of others. This does not imply that his whole life should be one of self-sacrifice, but it does mean that consideration for the rights and welfare of others should be an important factor in guiding his life, in determining his decisions and behavior.

Social service. *Efficiency in supplying the wants of interdependent society.* — The final broad social aim we have called social service. By social service in America we mean doing efficiently something that is valued in the interdependent, democratic industrial society described earlier in the chapter. To be of service or to succeed in such an interdependent society one must be able to do efficiently something which this society wants done. Some of the wants or needs of society were suggested above, namely, the need for food, the need for coal, the need for transportation. The *interdependence* of people to-day in supplying these needs gives meaning to the term "social" in this aim. Meaning is given to the term "service" when we think of it as it is used in modern business advertising. Whole pages of current magazines are used in advertising "John Blankville Service." Automobile manufacturers feature not only their

cars but their "service." Service thus suggests doing for people what they need done when they need it, giving them efficiently what they want when they want it. It is obvious that the effective satisfying of the needs and wants of people *contributes enormously to their happiness*; hence social service is an important educational aim.

Business service, home service, and civic service are easily understood. — In the outline on page 35 we divided social service into three types, — business service, home service, and civic service. Business service is the form through which most persons make their living. Home service is that important service which consumes the energy of so many women. Civic service includes many forms of governmental employment, such as public-school teaching, as well as the occasional but very important service which citizens render in voting and in inspecting public works and affairs. It is a simple matter to translate into terms of training for business service, home service, and civic service many of the concrete activities of elementary schools.

Translate broader social aims into detailed psychological aims. — Thus we have described the broader social purposes of a democratic education which aims to increase human happiness. We endeavored to prepare for an understanding of these purposes by telling first the story of how they grew out of the profound social changes paralleling the development of modern democracy, humanitarianism, and the factory system. As thus presented they stand in sharpest contrast with the narrow other-worldly aims of the Puritan colonists. We shall now proceed to consider certain more detailed aims of teaching which we can use to bridge our thinking from the broader social activities to the results that we want to produce from day to day in each boy and girl. Since we shall be focusing our attention now, not on society at large, but on each individual pupil, we shall call

this set of aims the detailed *psychological* aims of teaching. In order to make our whole scheme of aims and purposes clear, both social and psychological aims are shown in the following outline:

Broader social aims	*Detailed psychological aims*
1. Good health	1. Information
2. Harmless enjoyment	2. Habits
3. Good will	3. Ideals
4. Social service	4. Many-sided interests
a. Business	
b. Home	
c. Civic	

As stated above, each of the psychological aims refers to specific results that we want to produce from day to day in each boy and girl. Naturally each one of these specific results must be clearly useful in attaining the broader social aims outlined in the other column. For example, the reader might try to show to which of the broader social aims each of the following items contributes:

1. The *informational* facts "three feet equal one yard" and "Washington is the capital of the United States."

2. The *habits* of "keeping things in order," "keeping the teeth clean," and "beginning each sentence with a capital letter."

3. Many of the *ideals* expressed in Benjamin Franklin's sayings, such as "Early to bed" etc., and all of those in Lincoln's Gettysburg address.

4. Abiding *interests* in reading about current events, in discussing civic problems, in learning about industrial conditions, in following scientific progress, in keeping in touch with literature, music, and the drama.

We are justified in feeling sure of the values of these matters because it is easy to show that they do contribute to health, harmless enjoyment, good will, or social service.

The usefulness of the detailed psychological aims in guiding our thinking about teaching will become more apparent as we read later chapters. At this point only a few comments will be made on each.

Information important, but its exclusive emphasis is to be avoided. — Information in arithmetic, geography, and history has commonly been emphasized in elementary schools, often to the neglect of ideals and abiding interests. This is partially due to the fact that it is easy to put children to work acquiring information and easy to devise tests or examinations to determine whether they have learned it. It is much more difficult to develop abiding interests or ideals in each child and to test him to see if he has them.

The overemphasis on information has often led to an extreme reaction against requiring children to learn any exact facts. This neglect is just as unreasonable as overemphasis. In all forms of social service, — business, home, or civic, — reliable technical information is absolutely necessary for efficiency. In matters of health, the appalling loss of life from preventable diseases, such as tuberculosis, and the widespread distress from poor feeding are striking examples of the supreme value and need of education which emphasizes reliable scientific information. Special discussions of the principles of teaching information will be given in the chapters on subject matter and apperception.

Habits include skills and specific and general habits. — The habits most commonly emphasized in elementary schools have been the *automatic skills*, such as handwriting and skill in addition, subtraction, multiplication, and division. As in the case of information, these skills are very tangible and are easily tested; hence the emphasis upon them.

Next in order come certain *special habits*, such as the habit of checking one's problems to see if they are correct, or the habit of running on tiptoe in the kindergarten, or the habits of putting specific materials away in their proper places.

Finally we have certain *general habits* of which perhaps the most important and most tangible is the *habit of wide, rapid reading*. The habit basis for *rapid* reading is well started in good elementary schools by the end of the fourth or fifth grade, and later teaching tends to broaden it in the direction of a permanent habit of *wide* reading. Somewhat less tangible than the reading habit are such habits as those listed under kindergarten purposes on page 18, above; namely, noninterference with others, self-control, working for a remote end, obedience. In many phases of teaching, notably in drill, reading, writing, problem-solving, harmless enjoyment, expression, and moral training, the formation of habits is a prominent process.

Ideals; for personal efficiency and good will. — Examples of ideals were suggested above in connection with Benjamin Franklin's sayings; for instance, one of my students stated that she always troubled her mother by lying late in bed until she read Poor Richard's "Early to bed and early to rise makes a man healthy, wealthy, and wise." Thereupon she began to make this a rule and had observed it ever since. A kindergarten child may form the ideal, "It 's nice to be able to put on your own coat and rubbers"; a first-grade child the ideal, "It 's nice to be a good helper — I want to be a good helper"; and a second-grade child the ideal, "It is n't fair to keep the rest of the class waiting for me." These simple examples suggest that the teaching of ideals should be closely connected with the behavior and habits of the pupils in school and should proceed step by step from the more concrete matters such as "putting on coat and rubbers" to the more abstract general ideals such as "being on time" and "being fair." The development of such ideals as contribute to personal efficiency, and the formation of moral ideals as the basis of active good will, are among the most important functions of elementary-school teaching.

Many-sided abiding interests; determining permanent lines of desire. — Finally we may note what is meant by the fourth psychological aim, namely, many-sided interests. By interests here we mean the permanent lines of desire which determine to a very large extent a person's choices in life. An example of the building up of such a desire is found in the contrast between my own experience with the Bible and that of my little boy. Such Bible reading as I heard as a child was mere Bible reading, nothing else, and its meaningless abstractness made it repulsive to me. My son's first experience with Biblical material happened to be through reading, at seven years of age, James Baldwin's "Old Stories of the East," in which the adventures of David, Joseph, and Samson are fascinatingly told for second-grade or third-grade children. A large book of illustrations of "Travels in Bible Lands," with maps of Asia Minor, happened to be at hand for pleasant perusal about the same time. Recently, seeing Griffith's moving picture "Intolerance" gave a vivid notion of the life in Babylon, of Belshazzar's feast, of the battles of the Persians and the Babylonians. Meanwhile, studies in fourth-grade history had included thrilling accounts of the struggles between the Greeks and the Persians, of the heroic deeds at Thermopylæ, Marathon, and Salamis. In the newspapers and illustrated magazines he has followed the triumphs of the British in Mesopotamia and Palestine. For his tenth birthday, recently, he received a copy of L. E. Cragin's "Old Testament Stories for Little Children," in which the familiar stories first read in the Baldwin, and many others, are reproduced in more Biblical language, and the picture of Belshazzar's feast appears in close resemblance to that seen in "Intolerance." Having devoured the Cragin with interest, he is waiting impatiently for an Old Testament which has been promised to him. Thus as a result of a peculiar combination of adventure reading, fourth-grade history, the movies, and current

events he has developed an active desire, an active "reaching out," for more Biblical reading. Perhaps it may result in a permanent abiding interest in Biblical matters.

Many-sidedness of interest to insure breadth of mind and service. — Even casual consideration shows that such lines of desire, such abiding interests, are factors of enormous importance in determining one's behavior and happiness. The qualification, "many-sidedness," suggests that the school should endeavor to build up in each pupil worthy lines of desire or interests corresponding to all types of human experience, — interests in local community affairs, in larger national affairs, in affairs of the whole world, in health, in industry, in science, in music, in literature, in sports and games, in all activities which will tend to make a broad-minded, efficient, serviceable, happy individual. Throughout all the chapters that are to follow, this training of the many-sided serviceable individual for happiness and complete living may be kept in mind as the ideal towards which the broadening elementary schools are working.

Conclusion. — This will conclude our discussions of the broadening purposes of elementary-school teaching which have grown out of modern democracy, humanitarianism, and the industrial revolution. In the next chapter we shall turn to another characteristic feature of modern social life, namely, scientific business management, and show its application to classroom management. This discussion will *seem* much more practical than the present chapter. However, the broad ideas of aims and purposes which have been presented here will serve as guides in determining practices throughout the chapters that are to follow. Hence, before leaving this chapter the reader is advised to review the main points on page 12, above, and to memorize the outline of social and psychological aims on page 46.

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CHAPTER III[1]

ECONOMY IN CLASSROOM MANAGEMENT

Main points of the chapter. — 1. The school is a complicated institution with large opportunities for waste and for economy.

2. To avoid waste, principles of business management should be applied in the classroom.

3. Routine is necessary for efficiency and economizes time and energy.

4. Individuality, spontaneity, initiative, and reasoning may have the same place in a well-routinized school as they have in democratic social life.

5. The principal routine factors are (1) getting started right the first day, (2) seating of pupils, (3) passing to and from recitations, (4) handling materials, (5) attention to physical conditions, (6) maintenance of good order.

Need to correlate progressive theory and efficient practice. — In the preceding chapter we established a general point of view concerning the purposes of elementary-school instruction which will assist us in judging the value of processes of instruction to be discussed in later portions of the book. There is danger, however, that educational leaders and students will overemphasize the somewhat idealistic conceptions presented in the preceding chapter and will neglect to keep in mind the practical school situation in which such theories have to be carried out. This statement does not imply that the more progressive policies cannot be carried out in actual practice, but it does imply that the success of these policies will depend upon the efficiency

[1] About ten pages of this chapter are reprinted from the author's "Methods of Teaching in High Schools." (Ginn and Company, 1915.)

with which progressive teachers apply principles of business management in organizing their instruction. Consequently, in order to secure a proper balance in the mind of the reader between an enthusiasm for broader modern ideals in education, on the one hand, and principles of practical management, on the other, this chapter dealing with economy in classroom management is introduced at this point.

Teacher should avoid misdirected time and energy. — The school is a complicated institution, maintained by society to achieve certain specific results. The classroom activities should be planned carefully to make sure that they are directed toward securing these results most economically and effectively, and the possibilities of misdirected time, effort, and energy should be reduced to a minimum.

Principles of business management should be applied. — In any other institution or organization or plant that is as complicated as the school, efficiency depends to a large extent upon careful attention to the details of management. In a manufacturing plant, for example, great care is taken to provide for the most economic placing and handling of material, so as to eliminate waste motion. A manufacturer may enormously increase the efficiency of his plant by inventing a device that will require fewer operations to produce an article, or will produce several articles by the same number of operations as formerly produced but one. If such principles of economy are important in factories, where the product that is wasted or economized is material, they are much more important in the school, where the product to be wasted or economized consists of human lives. No factory or production process deals with more precious raw material than does the school; hence in no other process is it more important to give careful attention to the problems of waste and economy than in education.

Routinize mechanical aspects; use judgment in variable aspects. — The sources of waste in classroom work have

been divided by Professor Bagley into two principal types: The first type includes those where the waste is due to failure to organize properly certain mechanical aspects of the classroom activity. To this type he applies the term *routine factors*. The second type includes those sources of waste which are due to failure to adjust the classroom activities to the constantly varying capacities, interests, and responses of the pupils. To these aspects of school work Bagley applies the term *judgment factors*. The routine factors include those matters that recur in approximately the same form from day to day and which can be advantageously systematized, organized, and reduced to mechanical habits. The judgment factors, on the other hand, are constantly varying, and require of the teacher constant alert exercise of judgment in order to avoid misdirected time and energy.

List of principal routine and judgment factors. — The principal matters to which attention should be given from the standpoint of routine are the following:

1. Getting started right the first day.
2. Seating of pupils.
3. Passing and marching by pupils.
4. Handling materials.
5. Attention to physical conditions.
6. Maintenance of order.

The principal judgment factors are related to making provisions for individual differences in capacities and securing concentrated attention in the right direction. This chapter will discuss the elimination of waste through proper organization of the routine factors. The judgment factors will be considered in several later chapters.

Reasoning and individuality may have the same place in a well-routinized school as in social life. — Before taking up a detailed discussion of the routine factors, we shall endeavor to justify the "business conception" of school-keeping which has been outlined above, since, according to

many idealistic educators, " factory standards " and " machine processes " have no place in the school. They use these words as terms of reproach, and always speak of the " ideal school " in terms of freedom, spontaneity, initiative, reasoning, etc. Their point of departure for emphasizing the latter is a notion of democratic society in which these elements of freedom etc. have unrestrained operation. We shall endeavor to show here that freedom, spontaneity, individuality, initiative, and reasoning may have the same place in a *well-routinized school* as they have in *democratic social life*.

Examples of extreme spontaneity and extreme repression. Before doing this systematically, however, we shall make the problem somewhat more concrete by describing actual classes observed in two *extreme* types of schools. In the *first* school, spontaneity, individuality, and initiative were emphasized to the neglect of organization and self-control. In the *second* school, restraint and routine were emphasized to the neglect of reasoning and spontaneity.

First school; spontaneity unrestrained. — There seemed to be almost no discipline in the second-grade room which I visited [writes an observer]. When the children took a notion they shouted aloud, ran up to the teacher, ran around the room generally. Even the children in kindergartens which I have observed are better disciplined and know that in group work they must raise their hands. In the two periods in which I visited the second-grade room, I did not see a child raise its hand. Oh, yes, they were told that they must not talk while the class was busy, but each child who talked was told individually in such a gentle voice that the rest did not hear and nothing was done to the persistent offenders. Life in the second grade seemed to be a grand romp, where one did as one pleased generally.

Reasoning and irresponsibility. — In the sixth grade in the same school, the teacher gave the children excellent training in expression. She was especially skilled in making the pupils think and decide questions for themselves. Many of the children, however, especially the boys, were irresponsible. Fully half of the latter

were unprepared on assigned work, with careless excuses for having neglected the same. Although the teaching was intensely interesting, several of the children lounged in their seats and allowed their attention to wander at random.

Second school: disciplined to death. — Very different was the discipline in the other school visited. The room contained a sixth grade. Everything was orderly; not a pupil out of place. They found their exact places at the board very quietly. The pupils in one section were not called upon for practically an hour, but they sat and studied continuously. One could see that they were memorizing. I had not been there fifteen minutes before I wanted to flee — the repression was so pervasive — but I stuck it out to see what it was really like. Not a child smiled while I was there. Only one child (while the teacher was outside, speaking to a visitor) was in any way "out of order." He punched another boy passing, and it did my heart good to see it. It was the only bit of life in the room.

On my entering the office of this school, a mother with her boy was asking the principal if she could take him, for he was learning nothing in the school which he was then attending except to throw spitballs. I failed to learn the outcome of the consultation, but I presume he was accepted as a pupil, in which case I am positive he will not throw any more spitballs. But I wonder why? I wonder just what fear kept the room repressed as it certainly was. One motto written on the board was, "The great miracle worker is work"; yet I saw no miracle, although there was plenty of work. A miracle was needed greatly, however, for the room was dead.

How to balance reasonable freedom and orderly routine. — The contrast between these two schools presents concretely the problem which concerns us here; namely, what is the proper balance to secure in school between freedom, spontaneity, individuality, initiative, and reasoning on the one hand, and obedience, order, and routine on the other hand. Since this chapter is primarily a plea for a type of classroom management in which order and carefully organized routine prevail, we shall endeavor to show that this

type of procedure is not inconsistent with democratic freedom and reasoned responsibility. We can do this to advantage in connection with Bagley's answers to the arguments that have been advanced against routine in school work. (**1** : 32)

Democratic social organization often disregards individuality. — The first two objections that Bagley cites and refutes are that "mechanical organization disregards the individuality of the child" and that, since it is imposed from without, "it is an expression of arbitrary and despotic rule." The answer to this objection is that even in a democratic society social organization does the same thing as far as the individual is concerned. Society and its official representatives set definite lines within which the individual must behave. To him these lines may appear "arbitrary and despotic" and may seem to "disregard his individuality"; but he has to conform.

Traffic example. — Thus, a driver of a vehicle in the crowded streets of Chicago cannot make a crossing without the permission of the traffic policeman. Doubtless he would often prefer to dash ahead, after the policeman has blown his whistle to stop traffic in his direction. Doubtless it appears "arbitrary and despotic" when the policeman makes him take a long turn in going around a corner when his inclination is to "short-cut" across. But the traffic regulations, personified in the traffic policeman, are great social time-savers. When, as an experiment, the policemen were removed for a few minutes one day in the congested downtown district, it required only a short time for all traffic to come to a standstill, because the "individuality" of the drivers, chauffeurs, and motormen was given full sway and the "despotic rule" of the social guardians abolished.

Interdependence and obedience as important as independence in democratic America. — As shown in the preceding chapter, modern social life is characterized by the most elaborate and intricate interdependence for the necessities

of life — food, heat, transportation, etc. As a consequence of this interdependence, each individual must be trained to do his part in a dependable manner, obedient to the general rules; for example, the trainman must obey orders from the train dispatcher, the stenographer must get the mail out on time, the school teacher must follow the prescribed course of study.

Furthermore, democratic independence does not mean that each individual is free to do as he pleases. As a general rule, democratic independence in the government is found merely in the fact that all citizens are permitted to choose at short intervals political representatives who will make and execute laws which the citizens will have to obey. Their freedom does not consist in the privilege of not obeying authority, but in having a voice from time to time in choosing the authorities whom they will obey. Obviously, a child in school cannot be given the privilege of choosing the authority (the teacher) whom he will obey, although it is possible to make him acquainted with principles of community life that may guide him in his choice of representatives when he becomes a voter. The point to notice in connection with our *present* problem is that democratic representative society requires citizens to obey laws; therefore, the school is not being undemocratic merely because it requires children to be strictly obedient.

Efficient spontaneity may be encouraged by routine responsibilities.—Another objection which is advanced against providing for routine in school work is that it "discourages spontaneous effort." If this be true, it is just as true of democratic social life as it is of the school. In our own modern democratic life all activities are organized and nearly every person operates as part of some organization, whether it be the government, or a business house, or simply a family. As a rule, the individual who is working in an organization has certain lines prescribed for him, within which he may

be as "intelligently spontaneous" as he is capable of being. The buyer for a department in a large business concern or the head of a government office has certain definite routine responsibilities, but it is doubtful whether these interfere with his efficient spontaneity in perfecting his own work. The testimony of many persons would indicate just the opposite; namely, that they work harder for improvement when they know that they are responsible for certain specific matters than they do if their responsibilities are rather vague and undefined.

Many original thinkers are strong in routine work. — It is often falsely assumed that there is necessarily some antagonism between ability to do original independent thinking and careful attention to routine. Thorndike shows the fallacy of this idea in the following quotation:

> It is my privilege to know a fair number of original thinkers and workers in science, medicine, the ministry, law, and business. Such men are extraordinarily competent in routine work and extraordinarily strong in mere knowledge. The most original children of my acquaintance are so not by any denial of the claims of mere lesson-learning and skill-acquiring in traditional ways. On the contrary, they could beat the pedants and hacks of equal age at their own games. During the past month I have been studying the ratings of sixty electrical engineers employed by the Westinghouse Company and rated by the company's officers for originality and seventeen other qualities, such as thoroughness, knowledge, industry at routine tasks and the like. Far from there being any antagonism between originality and industry at routine tasks . . . or between originality and system, there is a positive correlation. (**3**: 407)

Routine does not necessarily eliminate rational methods. — Another objection that is sometimes urged against routinizing any school activities is that "mechanical organization in matters properly routine tends to spread to matters of a different nature." Unfortunately this is true in the case of

many teachers and administrators. It is to be regretted that there are many educational extremists who tend to line up in either one of the following columns:

Extreme formalists	*Extreme idealists*
1. All routine, no freedom.	1. All freedom, no routine.
2. Emphasize formal subjects, neglect content subjects.	2. Emphasize content subjects, neglect formal subjects.
3. Emphasize memorizing, neglect reasoning.	3. Emphasize reasoning, neglect memorizing.

But it is not necessary to be either an extreme formalist or an extreme idealist. It is possible to provide for an adequate study of the content subjects (geography, history, literature, science, etc.) by methods that involve reasoning, and at the same time to provide for routinizing those phases of classroom management in which it will result in economy of time and effort.

Do habits antagonize reasoning? — The point just mentioned is related to a final objection; namely, that "routine, or habit, antagonizes reason." By habit we mean the tendency to behave in situations in approximately the same ways as we have behaved in similar situations before. By reasoning we mean the tendency to reflect concerning readjusting or modifying our reactions to situations — to think out new methods of dealing with problematic situations.

The tendency to focus attention on either one or the other of these two phases of behavior, namely, either *habit* or *reasoning*, is brought out in an interesting way in comparing two definitions of education, one by William James (1842–1910) and the other by Professor John Dewey, two of the foremost American writers on psychology. In his "Talks to Teachers on Psychology" (page 29) James says, "Education is the organization of acquired *habits* of conduct and tendencies to behavior," and on page viii he says, "The aim of education is to make useful *habits* automatic." Here we have the emphasis

placed on the habit element in education. On the other hand, Dewey says, "Education is the *reconstruction* of experience." Here the emphasis is placed, not on the fixing of former methods of behavior, but on the breaking up of habits and the readjustment of one's old methods of behavior to meet new and changing situations.

Some habits free the mind for reasoning. — The apparent contradiction involved in these two definitions of education disappears, however, when we get a complete statement from one of the authors, in which both factors, habit and reason, are taken into consideration. Thus, James says:

> *We must make automatic and habitual, as early as possible, as many useful actions as we can. . . . The more of the details of our daily life we can hand over to the effortless custody of automatism, the more our higher powers of mind will be set free for their own proper work.* There is no more miserable human being than one in whom nothing is habitual but indecision, and for whom the lighting of every cigar, the drinking of every cup, the time of rising and going to bed every day, and the beginning of every bit of work, are subjects of express volitional deliberation. Full half the time of such a man goes to the deciding, or regretting, of matters which ought to be so ingrained in him as practically not to exist for his consciousness at all. If there be such daily duties not yet ingrained in any one of my readers, let him begin this very hour to set the matter right. (**2** (*b*): 122)

This quotation gives the true relation to establish between habit and reasoning, and may well furnish a motto for classroom activity; namely, "Make habitual, as early as possible, as many useful acts as you can, in order that the minds of teachers and children may be free to consider problems that are worth reasoning about." We shall now proceed to apply this motto to the six routine aspects of classroom management which were outlined above on page 55.

1. **Begin right the first day.** — The first consideration in classroom management from the standpoint of routine is

to *get started right* the first day. As James advises in the last sentence in the quotation given above, "begin this very hour to set the matter right." In classroom management, the time to set matters right is at the beginning. Any neglect of this advice results in lost ground which can only be recovered later by sacrifice of time and energy. James gives the following rule in this connection: "In the acquisition of a new habit . . . we must take care to launch ourselves with a decided initiative." Applied to the first day at school, this rule means that work should start off with a vigorous attack by pupils and teacher. It means that it is important to have the impressions of the first day be those that are to persist and give the keynote for the rest of the term.

Become acquainted in advance with the local situation. — In order to be able to do this, the beginning teacher, or a teacher in a new situation, needs to get on the ground some days before school opens and to familiarize herself thoroughly with the situation in general and in detail. This should include a study of the community, of the recent history of the school, of the ideals and policy of the present administration, of the building (with its classrooms, assembly arrangements, lavatories, playground, heating and ventilating systems), of the school library and other neighboring library facilities. It should include also a careful examination of the course of study and of the annual and daily programs. This should lead to a definite planning of the work to be covered for the whole term. If it is the teacher's first year in teaching, she would do well to advise with several experienced teachers concerning the best pace with which to advance.

Plan definite activities for the first day. — Having got the general situation in mind, she should plan in detail the work of the first week and be prepared to use the first day for purposes of serious instruction. In order to do this she will have to make sure that the necessary materials are on

hand, including possibly chalk, pencils, pens, ink, paper, maps, specimens, materials for construction, toys, or whatever may be required.

The work of the first day may include three elements: (1) steps to acquaint the teacher with the pupils, (2) steps to make the pupils feel at home and interested in the school, (3) some actual instruction. Such instruction may easily include free play, games, construction or story-telling in the kindergarten and primary grades, conversational introductions to new topics in all grades, lessons from books above the first grade where free textbooks are provided, or reviews of work of the previous year and related experiences.

With the first day used effectively in some such manner, the first step has been taken in the direction of economizing time and energy.

2. **Varied seating and grouping of pupils for various purposes.** — The second routine aspect of the classroom management concerns the seating or grouping of pupils for various purposes. Some examples will be given to illustrate the possibilities of improved instruction by attention to this matter.

Kindergarten circle replaced by more informal groupings. — The first examples are from the kindergarten where very strong traditions have prevailed concerning the seating and grouping of pupils. Often the traditional formal arrangements are not so well suited to the kindergarten activities as others would be. This fact is brought out in the following comments made by Miss Alice Temple in a survey of a conservative kindergarten system.

> Tradition seems to have decreed that there are but two possible arrangements for the children in the kindergarten. . . . For all work with materials they must be seated at tables; for all other exercises they must be seated or standing in a ring. The position in the ring is a good one for the playing of games, but for free conversation, or story-telling, . . . the gathering of the

From Butte, Montana, public kindergarten

MODERN TYPE OF KINDERGARTEN EQUIPMENT

Large blocks permitting of informal construction by the pupils

children into an informal group, near to and facing the teacher, is a much more natural and satisfactory arrangement. (**8**: 41)

[Similarly] during the singing period. In the schools observed, the children, with the exception of those in one kindergarten, were either seated or standing in a ring. Better results would be obtained if the children were gathered into a group standing near the piano where they could hear the teacher easily. They would realize then that this was the time primarily for singing. When standing close together and near the piano, they get the effect of the blending of voices; the teacher can easily place the monotones near her or near a child whose voice is true; a small choir may be assembled quickly for small group singing, etc. (**8**: 52)

Wide heavy kindergarten tables replaced by narrow folding ones. — The size and kind of table used in seating kindergarten children is an important routine factor in saving time and energy and improving instruction. This fact is brought out in the following comments by Miss Temple on the kindergarten equipment which she observed.

The tables now in use are of the older type, six feet long or more and two and one-half or three feet wide. They are made to accommodate children seated at all four sides. Narrow tables eighteen inches wide lend themselves to a much more satisfactory arrangement of the children with reference to the light and to the teacher, but more of them are needed for the same number of children. It is convenient to have some of these narrow tables of the six-foot length and others of the three-foot length. They may then be used singly by small groups of children or combined in various ways, according to the number of children in the group or the type of material with which they are working. When the entire class is to do the same work, directed by the teacher, an arrangement by which all face the teacher is usually best. When the class is divided into groups of different sizes for different kinds of work, other arrangements are more satisfactory. Furthermore, in a room equipped with small tables as well as with larger ones, the problem of seating the children at tables of the right height for them is very much simplified. One or more of the small tables

may be made lower by cutting an inch or two off the legs to accommodate the smaller children. Chair legs may be cut to correspond.

The tables described are folding tables, which may be easily disposed of when the entire floor space is needed for games or other physical activities or when the room is needed for assembly purposes. Three tables six feet by eighteen inches and six tables three feet by eighteen inches would be adequate for a group of thirty children. (**8**: 8)

Class grouping for primary reading. — Another example of the improvement of instruction by special seating or grouping of children is found in the arrangement of a group in primary reading. When the section that is reading does not consist of more than twenty pupils, small chairs are provided and the children grouped in semicircles near the teacher. This arrangement enables the teacher and pupils to speak in low voices and still be heard distinctly; it enables the teacher to observe carefully each child as he responds; and it provides a compact audience situation in which interest and attention can often be better secured than in the more spread-out arrangement that prevails when the little chairs are not available.

3. **Routinized passing and marching by pupils.** — The third phase of classroom routine is the organized orderly passing of pupils. This is a feature that is often overemphasized in extremely formal schools and entirely neglected in schools that overemphasize freedom and initiative. The desirability of such routine in social life is clearly illustrated in the traffic situation described above on page 58, and in the saving of life through fire drills. It is obvious that quick, quiet, and orderly passing by pupils to the board, or through the cloakroom, or through the halls, saves social confusion and energy in exactly the same manner as does traffic regulation at a busy street corner. Consequently, a teacher who drills her pupils carefully in these matters is not only

saving much time and energy for various school activities but is also training in habits that are closely paralleled in social life. A beginning teacher should observe carefully the methods of organizing assembly and dismissal used by various teachers and imitate the most successful. She should observe also such matters as the children running on tiptoe to and fro in the primary grades and pupils having regularly assigned places at the blackboard in all the grades.

4. **Handling materials.** *Monitors economize time for teacher and class.* — The fourth factor in routine management is the handling of materials. The greatest economy of time and energy can be effected here by enlisting the pupils as monitors. Many children are perfectly competent to perform monitorial services. The selection of such competent ones even in the first grade is amusingly described by Myra Kelly in her entertaining book of school stories and romance entitled "Little Citizens." The stories concern the fictitious Miss Bailey's first experiences in a slum district in New York. Miss Bailey's selection of monitors is described in the following words:

> An organized government requires a cabinet, and, during the first weeks of her reign over Room 18, Miss Bailey set about providing herself with aides and advisers. She made, naturally, some fatal and expensive mistakes, as when she intrusted the class pencils to the care of one of the Yonowsky twins who, promptly falling ill of scarlet fever and imparting it to his brother, reduced the First-Reader class to writing with colored chalk.
>
> But gradually from the rank and file of candidates, from the well-meaning but clumsy; from the competent but dishonest; from the lazy and from the rash, she selected three loyal and devoted men to share her task of ruling. They were Morris Mogilewsky, prime minister and monitor of the goldfish bowl; Nathan Spiderwitz, councilor of the exchequer and monitor of window boxes; and Patrick Brennan, commander in chief of the forces and leader of the line.

The members of this cabinet, finding themselves raised to such high places by the pleasure of their sovereign, kept watchful eyes upon her. For full well they knew that cruelest of all the laws of the board of education, which decrees "that the marriage of a female teacher shall constitute resignation." This ruling had deprived them of a kindergarten teacher of transcendent charm and had made them as watchful of Miss Bailey as a bevy of maiden aunts could have been. Losing her, they would lose love and power, and love and power are sweet. (**6**: 89–91)

Monitorial system extensively used in New York, 1805–1830. — In New York City the use of monitors had an interesting history, for from 1805 to about 1830 even the *instruction* in the schools was given by them in large rooms containing only one teacher to over two hundred pupils.

When a child was admitted, a monitor assigned him his class; while he remained, a monitor taught him (with nine other pupils); when he was absent, one monitor ascertained the fact and another found out the reason; a monitor examined him periodically, and when he made progress a monitor promoted him; a monitor ruled the writing paper; a monitor had charge of the slates or books; and a monitor-general looked after all the other monitors. Every monitor wore a leather ticket, gilded and lettered "Monitor of the First Class," "Reading Monitor of the Second Class," etc. (**4**: 103)

Monitors only for mechanical aspects; middle-grade example. — It goes without saying that the use of monitors for *instruction* in a modern elementary school is not to be advocated now. The above quotations, however, illustrate the fact that some children are perfectly competent to assist the teacher in many *mechanical matters*, and take great delight in doing so. An example of the reasonable use of monitors at the present time is found in the following account presented in one of the author's classes by an experienced teacher in the middle grades.

Monitors are chosen for two weeks to pass paper daily for arithmetic, language, penmanship, and drawing; others are appointed to collect and pass out pencils which are sharpened and fumigated twice a week; two children are given the duty of cleaning and replacing the erasers every noon, while two others wash the board and water the plants; a large boy is given the task of caring for the ventilation and another the raising and lowering of the window shades. After the first few days I am absolutely relieved of all responsibility for this part of school management.

Time wasted by kindergartens in preparing materials. — Another phase of economy of time with materials is illustrated by the large amount of time which many primary and kindergarten teachers spend in getting materials ready for children. The waste which is thus entailed is described by Miss Temple in the following observations:

There are unquestionably many kindergartners who spend much more time in work of this kind than is necessary or desirable. The work seen in the . . . kindergartens goes to show that the teachers often prepare the [materials] for the children so completely that there is little left for the children to do. For example, they draw outlines of objects for the children to cut, instead of giving the children the more valuable experience of trying to cut forms without the help of an outline, or they cut out rather elaborate paper forms, drawing lines where the children are to fold, leaving for the children only the last step or two of the whole process of construction. The results are likely to be excellent, but they do not represent the children's work. If the teachers would plan simpler forms of occupation and would be satisfied with cruder products, they would be able to develop in the children a degree of independence in handwork which does not now exist, according to the reports of the first-grade teachers who receive the children from the kindergartens. (**8**: 19)

This quotation illustrates clearly that careful study of the best methods of providing and handling materials not only saves time and energy but may also result in methods

which give the children valuable training. The same fact was illustrated by the monitorial services of children which give them excellent training in simple routine responsibilities.

5. **Physical conditions.** *Proper ventilation and lighting conserve energy.* — The fifth routine factor to be considered in economizing time and energy is attention to the physical conditions of the classroom. This is important not only from the standpoint of the temporary and permanent effects upon health but also from the standpoint of waste of energy. If a room is poorly ventilated or lighted, the energy of the pupils which is available for concentrated study is diminished.

Teacher may supplement the ventilating system. — The teacher should acquaint herself with the ventilating system and try to coöperate effectively in its management. If it does not work, she may be able to take steps to supplement it. For example, in two recitation rooms which I have used there was an ample supply of fresh air from the inlet in the wall near the ceiling in one end of each room. But in each case the outlet was placed in the wall near the floor directly under the inlet. As a consequence the air circulated very well in one end of the room, but three fourths of the room received practically no benefit from the system. Upon the suggestion of the teacher a metal deflector was made by the engineer and fastened on the inlet in such a way as to send the air diagonally across the room, thus providing a supply of fresh air for nearly all parts. In case there is no ventilating system, the teacher can at least provide for ventilation boards on the window sills. These will make it possible to keep the windows partly open during recitations in cold weather. The teacher should not rely upon her own impressions concerning the condition of the air in the room, for her sense of smell soon becomes fatigued in such a way that it does not inform her of the conditions.

Arrange so that pupils do not face the light. — In regard to lighting, the teacher's first duty is to arrange so that

pupils do not sit facing the light. The frequent neglect of this simple precaution is very striking. In kindergarten rooms it is not uncommon to find many children placed so that they face low windows and receive the full glare of the light directly in their eyes. Such positions handicap them seriously and waste much energy.

Avoid shadows on the page. — The second precaution is to arrange so that there are no shadows on the page at which the child is looking. In other words, there should be the same degree of illumination all over the page. If this is not the case, the pupil of the eye is constantly readjusting itself to the different degrees of illumination. This is not only a waste of energy, but it is often quite distracting and annoying, although the reader may not be clearly conscious of the cause of the annoyance. We have extreme examples of this variation in illumination on a day when shifting clouds cause a rapid alternation of sunshine and shadow. The eyestrain under these extreme conditions is quite noticeable. When one side or half of the page is well illuminated and the other part in deep shadow, the eyes may experience the same phenomenon on a smaller scale some fifty to a hundred times as they follow the lines of a single page.

Single source of illumination best. — The first step usually taken to avoid such a situation is to provide that the light shall come from a single source. The pupil can then easily sit in such a position that there are no shadows on his page. If there are two sources of light, the possibilities of sitting so as not to have shadows and at the same time not to face a light directly are greatly reduced. If there are a great many near sources of illumination, as in a railroad coach at night, the page may be streaked with light and shadow. In constructing schoolrooms it is now quite common to provide that the light shall come only from one side (namely, the left), in order to avoid shadows. Even when light comes

from more than one side in a room, the teacher, by proper manipulation of the shades and by proper directions to the pupils, can greatly reduce the loss of energy which would result from reading under conditions that cause strain or distraction.

Hygienic conditions improved in kindergartens recently. — Many of the activities provided for children in the old-fashioned kindergartens required such small movements and such concentrated attention as to result in serious nervous strain.

Great improvements have been made in kindergartens recently by providing activities and conditions better adapted to the health of little children. These improvements are summarized by Miss Luella A. Palmer in the following quotation.

> Health is the first consideration in the education of little children. Most of the kindergartners have discarded the occupations which were found injurious to the children's eyesight, very few overstimulate with nervous excitable play, and practically none forget to pay attention to the demand of the little bodies for free muscular movement. Yet the crying need of our kindergartens is for still better hygienic conditions. This is seldom the fault of the kindergartner; she knows the value of fresh air and sunshine, of space for free activity, of large blocks for building, of digging in the ground, of opportunities for individual children to rest or exercise as they desire, but many kindergartens are placed in such conditions that these good things are denied to the children.
>
> We have grown much since Dr. Stanley Hall in the *Forum* of January, 1900, criticized the kindergarten, particularly with regard to health conditions. Most kindergartners do the best they can in this respect. Wherever possible they have work in the open air, they ventilate the room, sometimes clean it themselves if janitors are careless, they keep the light out of the children's eyes, they try to have comfortable seats, to alternate periods of rest and activity, to have the atmosphere of the room quieting to the nerves, and they wash the children who come dirty, — often the first weeks of

kindergarten are devoted to different methods of impressing cleanliness. At mothers' meetings the topics are care of the child, his food, rest, and play. (**7**: 106)

6. **Maintaining good order.** *An important timesaver.* — The sixth and final routine factor which we shall consider in our discussion of economy of time and energy is good order. By good order we mean noninterference of the pupils with each other and proper attention by each child to the activities of the class as a group. It is obvious that the failure of any child to attend to the business in which the teacher and group are engaged is an important source of waste in the classroom.

Troublesome children. *Sometimes mentally and morally defective.* — As a rule the teacher may assume that if the other conditions of instruction are properly provided for, *most* of the pupils will behave themselves. There are nearly always, however, *a few* pupils whose selfish instincts are so strong, and whose social instincts and self-control are so weak, that they will not coöperate readily. Just as criminals in social life cause an enormous amount of social waste entirely disproportionate to their numbers, so these instinctively selfish and noncoöperative children cause a disproportionately large waste of time in the work of social groups in the school. Fortunately, the most extremely defective of such children are now recognized by science as being permanently mental and moral defectives and are not permitted in the regular public schools. Among such mental and moral defectives are idiots and imbeciles. Readers of this book probably realize that such defectives cannot be trained as ordinary children are trained, and that even with the best of training they will remain mentally and morally defective all their lives. Children who are endowed with slightly higher mental and moral powers, but who still are permanently mental and moral defectives, are often encountered in

the elementary schools. In the juvenile courts and psychological clinics of cities, special studies are now being made on a large scale to determine the best methods of diagnosing and dealing with such boys and girls.

Example of troublesome defective child. — The point for us to notice is that the presence of such a child in a classroom may greatly increase the disciplinary difficulties. An example of this fact is shown by the following observation of the discipline in a fifth grade before and after such a child was removed. The room contained fifty children, and the observer writes as follows:

Upon my first visit four boys and one girl were inclined to be troublesome, the girl especially. She was seated at a special table, and during a music lesson repeatedly turned about and grinned at the other pupils. She made no pretense at taking part in the work of the room, either then or later during the arithmetic and geography recitations. One could see she was a "terror." At recess she passed out with the others in quite an orderly manner, but on returning she kept the lad who was to close the dressing-room doors waiting two or three minutes, standing exasperatingly in his way. The teacher merely said, "Hurry up, Mary," and continued her work.

Upon my second visit the troublesome girl was not at the table. I ascertained that she had been expelled and that the mother was at her wits' ends to know what to do with her, so unbecoming was her conduct at home and on the street. Her teacher regretted that she had been unable to help the girl and had recommended that she be placed in an institution. Doubtless the city authorities would determine the advisability of this procedure through tests and investigation. Meanwhile, the boys in the room had settled down and the whole class was interested and busy.

Noncoöperative pupils even among ordinary children. — No hard and fast line can be drawn to separate the abnormal, nonsocial, difficult disciplinary cases from the more ordinary children with somewhat normal social instincts. Even after

the definitely defective children have been removed from public schools there will remain children whose selfish and nonsocial instincts are so strong that they will constantly present problems of discipline unless firm conditions of control are established by the teacher. With such firm conditions of control, such children are kept in restraint and the time and energy of the group are not wasted. Without such control, the social waste of the time and nervous energy of teachers and pupils is enormous. For this reason the methods of controlling nonsocial, difficult disciplinary cases deserve special study by teachers. The problem is so complex, however, that we cannot treat it here. Instead, we recommend that it be carefully studied in references 9 and 10 given on page 83. With these more difficult disciplinary problems left for intensive outside study, we shall turn to some of the more general problems of maintaining good order.

Ordinary discipline. *Through proper routine avoid opportunities for disorder.* — One of the most effective practices in securing good order is to avoid opportunities for disorder. Some of the most important steps to this end involve merely carrying out the directions for routinizing classroom activities described earlier in the chapter. If the first day is begun with a businesslike spirit, if there are certain definite tasks to be accomplished concerning which there is a clear mutual understanding between teacher and pupils, if the latter are seated to the best advantage, if materials are so placed as to obviate wasteful movements, conflicts, and confusion, if the ventilating and lighting are so arranged as to contribute to vitality and comfort instead of fatigue, annoyance, and irritability, — if all these matters are properly provided for, then many opportunities for disorder are eliminated.

Teacher's attitude a determining factor; authority, dignified reserve, and friendliness. — One of the most obvious facts in the maintenance of good order is the influence of the teacher's attitude toward the class, particularly during

the first few weeks and months. One of the most important questions in this connection concerns the proper balance to strike between friendliness and dignified reserve in order to preserve thorough respect by the children for their teacher's authority. Excellent suggestions along this line are contained in the following statement by a member of the Jesuit order, which has spent centuries of study upon problems of discipline:

The master in charge of the boys, especially in playtime, in his first intercourse with them has no greater snare in his way than taking his power for granted and trusting to the strength of his will and his knowledge of the world, especially as he is at first lulled into security by the deferential manner of his pupils.

That master who goes off with such ease from the very first, to whom the carrying out of all the rules seems the simplest thing in the world, who in the very first hour he is with them has already made himself liked, almost popular with his pupils, who shows no more anxiety about his work than he must show to keep his character for good sense — that master is indeed to be pitied; he is most likely a lost man. He will soon have to choose one of two things: either to shut his eyes and put up with all the irregularities he thought he had done away with or to break with a past that he would wish forgotten and engage in open conflict with the boys who are inclined to set him at defiance. These cases are, we trust, rare. But many believe with a kind of rash ignorance, and in spite of the warnings of experience, that the good feelings of their pupils will work together to maintain their authority. They have been told that this authority should be mild and endeared by acts of kindness. So they set about crowning the edifice without making sure of the foundations, and, taking the title of authority for its possession, they spend all their efforts in lightening a yoke of which no one really bears the weight.

In point of fact the first steps often determine the whole course. For this reason you will attach extreme importance to what I am now going to advise:

The chief characteristic in your conduct toward the boys during the first few weeks should be *an extreme reserve.* However far

you go in this, you can hardly overdo it. So your first attitude is clearly defined.

You have everything to observe — the individual character of each boy and the general tendencies and feelings of the whole body. But be sure of one thing, viz. that *you* are observed also and a careful study is made of both your strong points and your weak. Your way of speaking and of giving orders, the tone of your voice, your gestures, disclose your character, your tastes, your failings, to a hundred boys on the alert to pounce upon them. One is summed up long before one has the least notion of it. Try, then, to remain impenetrable. You should never give up your reserve till you are master of the situation.

For the rest, let there be no affectation about you. Don't attempt to put on a severe manner; answer politely and simply your pupils' questions, but let it be in few words, and *avoid conversation*. All depends on that. Let there be no chatting with them in these early days. You cannot be too cautious in this respect. Boys have such a polite, such a taking way with them in drawing out information about your impressions, your tastes, your antecedents; don't attempt the diplomat; don't match your skill against theirs. You cannot chat without coming out of your shell, so to speak. Instead of this, you must puzzle them by your reserve and drive them to this admission: "We don't know what to make of our new master."

Do I advise you, then, to be on the defensive throughout the whole year and like a stranger among your pupils? No! a thousand times, No! It is just to make their relations with you simple, confiding, I might say cordial, without the least danger to your authority, that I endeavor to raise this authority at first beyond the reach of assault. (**5**: 60–62)

Wholesome social atmosphere includes order and obedience to authority. — I have had many classes of teachers discuss the above quotation, and the conclusion of the majority has always been that "dignified reserve" is one of the best terms we can find to designate the appropriate attitude for a teacher to take toward a class, especially when this is coupled with a sincere and friendly interest in the progress

of each pupil. Certainly it is a desirable attitude in the fourth, fifth, and sixth grades, where the children are especially quick to take advantage of a susceptible teacher. Even in the kindergarten, authority and obedience may be established by somewhat similar means, as shown in the following description by Miss Temple of certain kindergartens which she observed:

> The social atmosphere in [these] kindergartens is very wholesome. The children are obedient, orderly, courteous, and very considerate of one another for children so young. The teachers have won the confidence and affection of the children through a sympathetic and respectful attitude toward them and through their own sincerity and earnestness. (**8**: 5)

The coexistence of the several terms in this quotation is worth noting,—obedient, orderly, courteous, considerate, confidence, affection, sympathy, respect, sincerity, earnestness, wholesome social atmosphere. They suggest an ideal picture of a well-disciplined situation. While the terms "authority" and "dignified reserve" sound somewhat harsher, they are perfectly consistent with the other terms listed and probably equally descriptive of the situation observed.

Disorderly primary grades make troublesome pupils for later grades.—As a rule, poor order below the third grade is not regarded as seriously as after that grade, although it entails just as large waste and results in very troublesome habits for later teachers to overcome. If a second-grade room behaves like the one described on page 56 above, the harm is not so apparent as it would be from similar behavior in the middle grades, where it would interfere more obviously and seriously with the studying and progress of pupils. The large amount of activity which has been introduced into primary grades recently in the form of plays and games, construction and expression, has made it difficult for some teachers to distinguish between mere *activity* and *disorder* on the part

of the children. Consequently, a disorderly room is often mistaken for one in which children are being educated through activity. As a matter of fact, the children are really developing habits of lack of self-control which will seriously hamper their later progress in school. This fact appears very prominent in some of the so-called "model" schools of the country, where the children in the middle grades behave as little imps, utterly lacking in self-control. That this is not a necessary condition is suggested by the kindergarten situation described above, in which the children were "obedient, orderly, courteous, and considerate." If kindergarten children can acquire such habits, certainly first-grade and second-grade children can also. With such habits, the discipline in the middle grades where children tend to "write notes," throw spitballs, and do sneaky things generally, ought to be made easier instead of being made more difficult by the disregard for authority and group interests which results from unrestrained freedom and spontaneity in the primary grades.

Simple rules desirable; abstract rules ineffective.—As the children progress through the grades, they should become habituated to certain standards or rules of behavior which should determine their conduct. Even in the kindergarten, simple rules are effective, such as the following: "Raise your hand when you want something or need help," "During the story hour, when seated on the floor, keep your hands off other children." In some kindergartens after such special rules have been learned and habituated, even the more general rule "Do not bother your neighbors" might be made effective. The difficulties involved in such general rules, however, are suggested by Thorndike in the following quotation:

> Avoid making rules involving distinctions which the pupils cannot make. "No communication between pupils without especial permission except in the five-minute recesses between periods," a

ten-year-old can understand; the distinction between a period and the five-minute recess is easy. But "No communication between pupils that disturbs the work of the class" will be beyond him. Mr. A. C. Benson relates that a boy who was rebuked for putting a dormouse down the neck of a very easy-going master asked, in all good faith, "But how was I to know that he drew the line at a dormouse?" Rules which vary in complex ways with attendant circumstances or with the motive for the act are unsuitable for young children and for the duller older children. Moral as well as intellectual progress should be made step by step along clear pathways. (**11**: 186)

Consistent, decisive enforcing of rules. — In securing obedience to rules, two important factors are *consistency* and *decision* on the part of the teacher. The influence of lack of consistency is illustrated by teachers and parents who are always threatening but never executing. They announce that certain consequences will follow upon certain acts, but they are not consistent in carrying out their statements. Pupils very soon learn that they are likely to escape the consequences in many cases, and are willing to take the chances or to gamble on the issue.

The influence of lack of decision is illustrated by the remark often made by a distracted mother when she says to her child, "I don't know what I will do to you if you don't behave yourself." No doubt teachers often find themselves in the same uncertain condition, but it does not improve matters to let the pupils know it. If possible, take the time which may be necessary to determine upon the best course of action and then proceed to carry out your decision.

Regard all offenses as against the group, not the teacher. — The final feature of maintaining good order which we shall consider is that each offense should be regarded by pupils and teacher as essentially an offense against the class or group whose progress is interfered with. A simple example is found in the case of the first-grade child who

is noisily playing with something while the teacher is telling an interesting story. The teacher's remark, "We shall have to wait until Mary is ready to listen," is a good opener to put the situation in the right light. It avoids the notion that the misbehavior is an offense against the teacher or that it centers in a personal conflict between the latter and the offender. Regarding the offense as against the group enables the teacher to deal with it in a purely objective impersonal manner. This will save much emotional storm and stress that entails an unfortunate waste of nervous energy for both pupils and teacher and temporarily impairs their efficiency. Furthermore, it stresses the attitude of regard for community rights and welfare, which is one of the essential factors in moral training.

Conclusion. — This will conclude our discussion of economizing time and energy through effective routine in classroom management. Our point of departure for the discussion was a comparison of the classroom with democratic social conditions. We found that in democratic America citizens are required to be strictly obedient to the representative government, and that effective conduct of American business depends upon the application of principles of scientific business management. Paralleling this social situation in the school involves cooperation, order and obedience on the part of the pupils, and careful routine provision for the first day, for the seating, assembling, and passing of pupils, for monitorial assistance by pupils in handling materials, and for proper lighting and ventilation. With desirable habits established in all these matters, much of the time and energy of teachers and pupils is conserved for attaining the broader aims of teaching, — health, harmless enjoyment, good will, and social service. In the next two chapters we shall study the principles determining the selection and arrangement of *subject matter* to attain these ends.

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CHAPTER IV

SELECTING SUBJECT MATTER

Social and Relative Values; Scientific Basis

Main points of the chapter. — 1. The subject matter taught in schools should change as social needs change.

2. The most striking examples of such changes historically are the following:

a. Changes from oral to silent reading necessitated by increased reading matter, speed of intercommunication, and almost universal ability to read in America.

b. Changes in arithmetical content to parallel changes in business procedure.

c. Development of civic-moral teaching to replace religious-moral teaching eliminated from American elementary schools by sectarians.

d. Use in kindergartens of modern city activities to replace the activities of a German village of 1837.

3. Social needs vary not only historically but between different communities to-day, and subject matter in different schools should vary accordingly.

4. The adaptation of subject matter to meet varying social needs is an example of the social point of view represented by Spencer and Dewey.

5. Variations in the relative social values of topics should be carefully determined by scientific investigations.

6. Such investigations of the writing vocabularies of children and adults have reduced the number of spelling words taught from 10,000 to 4500.

7. To be scientific, such an investigation must be mathematically precise, objective, completely described so it can be verified, made by an expert, and impartial.

Relation to preceding chapters. — In the two preceding chapters we developed two fundamental points of view which should be coördinated and kept in mind as the bases of progressive efficient teaching. The first emphasized the broadening purposes of elementary-school teaching in training for health, harmless enjoyment, good will, and social service. The second point of view emphasized the application of principles of effective business management to classroom activity in order to achieve progressive ideals economically and effectively.

Having gained an idea of the purposes that elementary teachers should strive to achieve, and of the fundamental principles of administration that should prevail in the classroom, we come to our third main topic; namely, the selection of the subject matter that is to be used in achieving the broad aims of education. We shall discuss this topic under the following headings:

I. Adapting subject matter to varying social needs.
II. Determining the relative values of topics.
III. Characteristics of scientific procedure in selecting subject matter.

I. Adapting Subject Matter to Varying Social Needs

Adapting subject matter to varying social needs continues social point of view. — We reached many of our conclusions in the preceding chapters by studying social life outside the school in order to determine what the schools should do. For example, we found American life characterized by (1) democratic representative government, (2) intricate interdependence resulting from the specialization of industry and the subdivision of labor, (3) scientific business management. For each of these we discussed corresponding features of schooling. Similarly, we shall open the discussion of subject matter from the social standpoint and, for concreteness,

shall begin with the teaching of reading, which occupies such an important place in elementary schools.

Reading: social change from oral reading to rapid silent reading. — In considering the adaptation of our teaching of reading to meet social needs, we shall consider first the relative social importance of oral reading and of rapid silent reading. The facts to be emphasized are (1) that rapid silent reading is very important now and "expressive" oral reading relatively unimportant, (2) that skilled oral reading was very important at an earlier period and as a consequence has retained a place in the school which it no longer deserves. We shall begin our discussion with a picture of the reading situation outside of schools about the time of our Revolutionary War.

Oral reading important about 1776; scanty reading facilities. — In getting a picture of the reading situation in America about 1776, we shall consider the small number of books and periodicals available, the slowness of communication by mail, the inability of many people to read, and the consequent value of oratory and eloquence in politics. The small number of books available has already been suggested by the narrow curriculum of the elementary schools described in Chapter II. There it was indicated that until 1750 all the reading matter in most of the elementary schools consisted of the "New England Primer," or some similar primer, and the Bible. In many of the poorer homes in the early colonial period the Bible was the only book for adult reading, supplemented in some homes by a few other religious books such as Wigglesworth's "The Day of Doom, or a Poetical Description of the Great and Last Judgment with a Short Discourse on Eternity." In a few favored homes a small "chest" of books constituted a treasured library.

Franklin's improvements illustrate poor colonial facilities. — A number of improvements had been made in the reading situation in America by the time of the Revolution,

but even these may be used to show how scanty the reading facilities were. Some of these improvements are associated with the work of Benjamin Franklin, the leading publisher of the period. Everyone is familiar with "Poor Richard's Almanac" and its witty sayings. Franklin published the first number of the Almanac when he was twenty-six years old (1732) and continued to issue numbers annually for twenty-five years. The library of many a farmer consisted of the family Bible and one or more numbers of this famous almanac.

In the publication of his almanac, Franklin was not peculiar, however, since almanacs constituted the most popular *periodical* literature of the day. Speaking of this fact, McMaster says:

> The almanac was the one piece of literature of which the sale was sure. Not a household for a hundred miles around the printer but, if there was sixpence to spare, would have a copy. In remote towns, where money was not to be had, a dozen copies would be bought with potatoes or wheat, and disposed of one by one, — at the blacksmith's for a few nails; at the tavern for rum; at some neighbor's in payment of a trifling debt. Chapmen carried them in their packs to exchange with copper kettles and china bowls, for worsted stockings and knit gloves. They were the diaries, the journals, the account books of the poor. Strung upon a stick and hung beside the chimneyplace, they formed an unbroken record of domestic affairs, in many instances for thirty years. On the margins of one since picked up at a paper mill are recorded the interesting cases of a physician's practice, and the names of those who suffered with the smallpox and the flux. Another has become a complete journal of farm life. A third is filled with verses written in imitation of Pope and Young.

It is not by mere chance that the second piece of printing done in the colonies, and the first piece done in the middle states, were almanacs. Samuel Atkins told no more than plain truth when, in the preface to "Kalendarium Pennsilvaniense," he declared that

wherever he went in his travels he found the people so clamorous for an almanac that he was "really troubled," and did design according to his knowledge to "pleasure his countrymen" with what they wanted. (**11**: 98)

Franklin's establishment of the first circulating library in America, in 1732, in Philadelphia, also illustrates the primitive reading facilities of the day.

The slowness of communication by mail is illustrated by Franklin's work as postmaster-general, beginning in 1753.

In his hands the whole system of the post office underwent a complete change. He straightened the routes; he cut down the postage; he forced the postriders to hasten their pace; he opened the mail bags to newspapers by whomsoever printed, and made their carriage a source of revenue to the crown; he established the penny post in the large towns; and for the first time advertised unclaimed letters in the newspapers. Mails that used to go out but once a week began under him to go out three times as often. Riders who in the winter used to make the trip from Philadelphia to New York but twice each month now, in the coldest weather, went over the route *once a week*. (**11**: 158)

Neglect of primary education lessened number of readers. — It is obvious that in such a situation, with few books and periodicals and very slow intercommunication, there was not much reading by the masses, apart from Bible reading. Moreover, many persons could not read, the neglect of *primary* education being very startling in many places such as Boston, New York City, rural Pennsylvania, and in many places in the South.

Democratic interest in public questions placed premium on oratory. — Yet there were many public questions in which the common people of the colonies were vitally interested and concerning which the leaders wanted decisive action. These questions centered in the struggle with England before the Revolution and in the political struggles between the various parties after the Revolution. Consequently oratory

was depended upon to arouse and influence the people to an extent that it is difficult for us to appreciate to-day, unless we live in a part of the United States where the schools are very poor, newspapers and periodicals very scarce, and oratory, as a consequence, still flourishing. An exaggerated parallel to our colonial condition is found in the Russian revolutionary situation of 1917. In Russia there was the same intense interest in a democratic revolution as there was in America. Reading matter was equally scarce in the rural districts and the illiteracy probably more general. In Russia, as a consequence of the illiteracy, the revolutionary government became largely an orgy of oratory. The illiterate soldiers being unable and unaccustomed to read and to study out problems for themselves were easily swayed by the glowing promises of persuasive orators.

Eloquence emphasized in early school readers owing to its social value. — The social importance of oratory in America about the time of the Revolution found its counterpart in the emphasis on oratory, eloquence, and expressive reading in the school readers. One of the first and most successful of these bore evidence to this fact in its title, namely, Bingham's "Columbian Orator," published in 1797.

The title-page of this reader, which rivaled Webster's in popularity, is shown on page 90. Following this page were about twenty-five pages discussing the art of eloquence. Then came the selections for reading and declamation. The first page of these selections and the introductory heading are shown on page 93. The emphasis on the art of eloquence as the supreme aim of reading is evident in all these parts of the book. Among the selections are the following lines, which were almost universally recited, with minor changes, in all the "little red schoolhouses" of America down to 1850. In reading this early edition notice the national pride in "Columbia's soil" and the state pride represented by "Massachusetts boast."

THE

COLUMBIAN ORATOR.

CONTAINING

A VARIETY OF

ORIGINAL AND SELECTED PIECES,

TOGETHER WITH

RULES;

CALCULATED

TO IMPROVE YOUTH AND OTHERS IN THE

ORNAMENTAL AND USEFUL

ART OF ELOQUENCE.

By CALEB BINGHAM, *A. M.*
Author of, the American Preceptor, Young Lady's Accidence, &c.

"Cato cultivated *ELOQUENCE*, as a necessary mean for defending THE RIGHTS OF THE PEOPLE, and for enforcing good Counsels."
ROLLIN.

PROMINENCE OF ELOQUENCE IN AMERICAN EDUCATION AFTER THE REVOLUTION

Illustrated by title-page of a popular reader, originally published in 1797. Note the frequent reference to eloquence and its connection with political conditions

LINES SPOKEN AT A SCHOOL-EXHIBITION, BY A LITTLE BOY SEVEN YEARS OLD

You 'd scarce expect one of my age,
To speak in public, on the stage;
And if I chance to fall below
Demosthenes or Cicero,
Don't view me with a critic's eye,
But pass my imperfections by.
Large streams from little fountains flow;
Tall oaks from little acorns grow:
And though I now am small and young,
Of judgment weak, and feeble tongue;
Yet all great learned men, like me,
Once learn'd to read their A, B, C.
But why may not Columbia's soil
Rear men as great as Britain's isle;
Exceed what Greece and Rome have done,
Or any land beneath the sun?
May n't Massachusetts boast as great
As any other sister state?
Or, where 's the town, go far and near,
That does not find a rival here?
Or where 's the boy, but three feet high,
Who 's made improvements more than I?
These thoughts inspire my youthful mind
To be the greatest of mankind;
Great, not like Cæsar, stain'd with blood;
But only great, as I am good.

The prefaces of the readers during the first half of the nineteenth century vie with each other in proving that each offers superior training in enunciation, declamation, and elocution. Even as late as 1854 we find the following statement in a preface:

As an accurate and distinct articulation forms the basis of good reading, it should receive our first attention in instruction, and be constantly taught until words are habitually delivered out from the

lips as beautiful coins newly issued from the mint, deeply and accurately impressed, perfectly finished, neatly struck by the proper organs, distinct, in due succession, and of due weight.

Thus we see how expressive oral reading secured its prominent place in the schools in response to the need for oratory and eloquence in a relatively primitive democratic community where books, newspapers, and periodicals were scarce, intercommunication very slow, and many persons unable to read silently effectively.

Silent reading now important; oral infrequent. *Books and periodicals numerous; intercommunication rapid; reading universal.*— In contrast with the Revolutionary War situation, we may picture conditions at the present time in the United States. Free city libraries contain hundreds of thousands of books which are delivered conveniently through branch libraries within easy walking distance of most homes. Many small towns have their free Carnegie libraries. Convenient libraries abound where for two or three cents a day the latest books of fiction may be rented and taken home. Hundreds of periodicals appear weekly or monthly in the news stands in the large cities, and a score appear even in the small towns. News is transmitted so rapidly by wire that President Wilson's famous statement of America's war aims, issued in 1918, was received in all the larger cities *all over the world* within a few hours after he read it to Congress in Washington. As a result of the work of the public schools, most adults in the United States can read, the number of illiterate adults being only 8 per cent in 1910. In the more favored states even a smaller number is found; for example, less than 2 per cent in Iowa and Nebraska.

Yet many adults neglect wide effective silent reading.— Yet, while nearly everybody can read and does read silently, it remains to note whether they read enough or effectively enough. The following example will probably serve to

PRACTICAL PIECES FOR SPEAKING;

CONSISTING OF

ORATIONS, ADDRESSES, EXHORTATIONS FROM THE PULPIT, PLEADINGS AT THE BAR, SUBLIME DESCRIPTIONS, DEBATES, DECLAMATIONS, GRAVE AND HUMOROUS DIALOGUES, POETRY, &c. VARIOUSLY INTERSPERSED.

EXTRACT FROM AN ORATION ON ELOQUENCE, PRONOUNCED AT HARVARD UNIVERSITY, ON COMMENCEMENT DAY, 1794.

THE excellence, utility, and importance of ELOQUENCE; its origin, progress, and present state; and its superior claim to the particular attention of Columbia's free born sons, will exercise for a few moments the patience of this learned, polite, and respected assembly.

Speech and reason are the characteristics, the glory, and the happiness of man. These are the pillars which support the fair fabric of eloquence; the foundation, upon which is erected the most magnificent edifice, that genius could design, or art construct. To cultivate eloquence, then, is to improve the noblest faculties of our nature, the richest talents with which we are entrusted. A more convincing proof of the dignity and importance of our subject need not, cannot be advanced.

The benevolent design and the beneficial effects of eloquence, evince its great superiority over every other art, which ever exercised the ingenuity of man. To truct, to persuade to please; these are its objects.

To

HISTORICAL ORIGIN OF EMPHASIS ON ORAL READING

Illustrated by praise of eloquence for "Columbia's free-born sons," in the first selection from Bingham's "Columbian Orator," originally published in 1797

illustrate that many persons need more effective training in rapid silent reading.

Example. — In January, 1918, America had been in the war about nine months. The efficiency of the War Department was being seriously questioned by certain prominent persons and newspapers, and the resulting controversy aroused great interest on the part of the public. The reading habits of this public are well illustrated by the following facts and incidents.

Social information. — The Secretary of War spent a whole day addressing a gathering of members of Congress and others, explaining the steps taken in preparation for the war, in order, as he said, that all citizens might know the facts and judge for themselves. In the newspapers, his address filled almost *three pages.*

Slow oral reading. — A woman decided to read this important information to her family. She read aloud for *forty-five minutes,* and then had to desist, as she was hoarse. She had read about *one fifth* of the address.

Rapid silent reading. — Another member of the family who does much rapid silent reading then decided to finish reading the address for himself. Reading actively and silently, *in forty-five minutes* he was able to glean all the essential facts of the remaining *four fifths.*

Social neglect of silent reading. — The next day three adults, with nothing to do except loaf at a winter resort, were heard roundly condemning the Secretary for his address. Upon being asked if they had read it, they said, "No, it is too long." They were basing their condemnation on a one-third column editorial in a newspaper politically opposed to the administration. Yet the Secretary had said that the facts were being presented fully so that citizens might know them and judge for themselves.

Schools should subordinate oral and emphasize silent reading. — This example is typical of the present social need for training in habits of wide, effective, rapid silent

reading. On the other hand, the social need for training in expressive oral reading which prevailed earlier in our history has almost entirely disappeared. Yet many schools continue to emphasize expressive oral reading and to neglect almost entirely training in effective rapid silent reading.

Adapting arithmetic to social needs. *Obsolete and new topics.* — The second subject which we shall use to illustrate the adapting of subject matter to changing social needs is arithmetic. Arithmetic is taught primarily for its utility in business operations and in various kinds of measurement. As the business processes change from generation to generation, the arithmetic taught in the schools should change accordingly. For example, English money was at one time the dominant currency in the colonies. Then the table of English money was very important in American arithmetic. Now it has little social value. Before the establishment of a federal money in 1786 decimal fractions were little used in America; consequently elaborate operations with common fractions had to be taught in the schools. Now decimals are used in social life for nearly all *complicated* fractional calculations. Hence the use of common fractions in such calculations is socially wasteful and should be omitted from arithmetic teaching.

Management of modern social activities is largely quantitative. — Similarly, many *new* forms of business activity have developed in which arithmetic is used very extensively and which are important in the lives of many persons; for example, life insurance, savings accounts, checking accounts, etc. In the upper grades of the elementary schools the study of these social activities is being introduced, and training is given in the arithmetical processes involved. Furthermore, arithmetic is acquiring an increasing importance in school, owing to the tendency to use it more and more in the scientific business management of all affairs, — industrial, commercial, educational, philanthropic,

and so on. This fact is well expressed by Bobbitt in the following quotation:

> The probabilities are that the social and vocational conditions of the coming generation will require that everybody be more mathematical-minded than at present.
>
> The content of mathematics courses is to be determined by human needs. One of the fundamental needs of the age upon which we are now entering is accurate quantitative thinking in the fields of one's vocation, in the supervision of our many coöperative governmental labors, in our economic thinking with reference to taxation, expenditures, insurance, public utilities, civic improvements, pensions, corporations, and the multitude of other civic and vocational matters. (**1**(*a*): 46)

From religious-moral instruction to civic-moral instruction. *Colonial morality based on Ten Commandments and fear of Satan.* — Our third example of adapting subject matter to changing social needs is the organization of moral and civic training to take the place of the training in religion which has been eliminated from public schools. In the chapter on broadening purposes of elementary teaching we noted that the dominant purpose in early New England elementary schools was to train children to avoid sin and Satan. Throughout history similar religious teaching has been depended upon to a large extent to train children to behave themselves. Examples of this teaching are to be found to-day in the fact that most persons derive their notions against stealing, lying, swearing, etc. from the Ten Commandments.

Religion eliminated from public schools by sectarians. — During the nineteenth century, however, religious teaching was gradually eliminated from American public schools. This elimination was not brought about by persons opposed to religion, but by intense sectarian religionists who were afraid of the interpretations that teachers of a different sect might place upon Biblical matters. One legal basis for the

elimination of religion was found in the American theory of the separation of Church and State, the public schools being state institutions.

Civic-moral teaching being developed. — The disappearance of religious instruction from the public schools is one of our most striking examples of the change in subject matter paralleling a change in social life generally. The elimination of religious teaching left moral training in the schools without sanction or force in many instances. Yet the congested city life and the intricate social interdependence resulting from the industrial revolution created a very serious need for moral training. Efforts to meet this need by organizing civic-moral teaching are being made at the present time.

Social changes influencing kindergarten. *From rural village of 1837 to modern city of electricity and automobiles.* — Our fourth and final example of changing subject matter to meet changing social needs is found in the kindergarten. The first kindergarten was established in 1837, in a small German village, by Friedrich Froebel (1782–1852). One of Froebel's great ideas in establishing this school for little children was to make it a miniature society in which the processes of the home and community would be reproduced in play, and the children thus introduced to a study of social activities. It seems quite obvious that success in doing this in any kindergarten would depend upon beginning with the activities of the homes and the community in which that kindergarten happens to be located. Strange to say, however, for decades kindergartens restricted themselves to using the activities and situations which Froebel had found in his little German village, regardless of the fact that many of the situations of modern city life were not represented there. Progressive modern kindergartens, however, are more consistent in carrying out Froebel's fundamental idea, and they begin with the activities which the little ones may have an

opportunity to actually witness. Since charcoal burners and blacksmith shops are very scarce in many city neighborhoods, these examples from Froebel's list are omitted. Since automobiles are frequent, they are likely to be added. In one kindergarten in Chicago, the children spend considerable time studying and constructing the station of an elevated railway which passes near the school and which is one of the most important factors in this community.

Adapting subject matter to different communities to-day. *Kindergarten changes illustrate both historical and local adaptation.* — The adaptation of kindergarten activities to the local community illustrates another phase of the social adaptation of subject matter which we have been discussing. In the change from oral to silent reading, from colonial arithmetic to twentieth-century arithmetic, from religious-moral teaching to civic-moral teaching, and from Froebel's rural village of 1837 to the modern city of steam, electricity, and automobiles, we were emphasizing the *historical* variations in social needs and parallel changes in subject matter. But social needs vary also *between different communities to-day*. Perhaps the most striking examples are found in the kindergartens, as shown in the contrast between the attractive picture of immaculate kindergarten children on page 16 and the statement by Miss Palmer that in many slum kindergartens much of the work of the early weeks centers in training the children to keep themselves clean. In kindergartens for negro children special emphasis may be placed on singing and dancing because of the large part which rhythmic activities play in the social life of negroes. Another striking example of community adaptation is found in the first grades filled with children from homes where a foreign language is spoken. The problem of teaching reading, spelling, and language in such rooms is very different from that in most first grades. Similarly, variations for rural and city

children could be described in several subjects, but sufficient examples have been given to impress the idea that as social needs change, subject matter should change. Often subject matter is retained, however, which was adapted to a social situation which no longer exists. Often a social need exists for a long time before appropriate subject matter is introduced into the schools. Teachers should be alert to comprehend the social needs of the community in which they work and be actively progressive in adapting their teaching to these needs.

General social point of view emphasized by great sociologist, Spencer. — As already suggested, the habit of thinking of adapting teaching to present-day social needs is known as the social point of view in education. We worked from this point of view when we studied the broadening aims of teaching in relation to our interdependent democratic society, and when we paralleled modern scientific business management with effective classroom management. Our discussion of adapting subject matter has furnished further concrete examples. One of the leading exponents of this general social method of thinking was Herbert Spencer (1820–1903), the great English writer on sociology. When Spencer died, in 1903, the greatness of his influence was attested by articles concerning him which appeared in nearly all periodicals and newspapers. The study of sociology, which was one phase of Spencer's life work, concerns the life of social groups, their institutions, their industries, government, religion, morals, superstitions, science, art, etc. Naturally in his study of social activities, Spencer interested himself in *education* and wrote a series of very influential essays concerning it. The most notable of these, entitled "What Knowledge is Most Worth," was published in 1859. In it Spencer examined English social life from the standpoint of the changes which the industrial revolution and applied

science had brought about, and then criticized severely English education for failing to keep pace with social progress. He said:

> That which our school courses leave almost entirely out we find to be that which most nearly concerns the business of life. . . . Had there been no teaching but such as is given in our public schools, England would now be what it was in feudal times.

Read Spencer. — Spencer's style is so concrete, vivid, and convincing that all beginning teachers ought to read this essay, which is published as the first chapter of his book entitled "Education." The chapter contains, besides the general social point of view, many valuable ideas, such as the definition of education as "training for complete living," which we used in Chapter II, and an "analysis of life's activities," which parallels our statement of social aims given on page 35.

Spencer's opinions important but not infallible. — In reading Spencer, however, it is important to remember that much of what he says is merely his own opinion, and there are possibilities of his being mistaken. As in recent years, so in Spencer's day, the exact scientific facts were lacking to determine the real truth about many educational questions. The characteristics of such scientific facts we shall discuss later. In their absence, we often have to depend on the opinions of men of genius who have devoted much time to the study of educational questions. Spencer was one of these.

Dewey also emphasized social viewpoint; opinions need scientific testing. — Another great thinker and writer who more recently has emphasized the social point of view in education is Professor John Dewey of Columbia University. Dewey's "School of Society," published in 1899, took its point of departure, as did Spencer, from the industrial revolution, and proposed certain changes in elementary-school work to correspond. The book is easily read. In reading it, however, just as in reading Spencer, students

should remember that many of the suggestions made are merely Dewey's opinions, and while they carry great weight as the expressions of one of America's greatest thinkers, some may not be found true when tested by scientific evidence. The meaning of "scientific evidence" will become clearer in the next section of this chapter on methods of determining the relative values of topics.

II. Determining the Relative Values of Topics

Need to determine which valuable topics are *most* valuable. — When a teacher begins to study the social values of subject matter, she may soon find that the social needs are so numerous, or the material so plentiful, or the time so limited, that she will have to select carefully from current valuable subject matter that which is *most* valuable for the children she is teaching.

Spencer's classic discussion of relative values. — The question of relative values which thus arises is another of the issues which Spencer discussed most effectively. The title of his essay "What Knowledge is Most Worth" is a striking phrasing of the question. His vigorous presentation of the problem is contained in the following quotation:

> The question which we contend is of such transcendent moment is not whether such or such knowledge is of worth, but what is its *relative* worth? When they have named certain advantages which a given course of study has secured them, persons are apt to assume that they have justified themselves, quite forgetting that the adequateness of the advantage is the point to be judged. There is, perhaps, not a subject to which men devote attention that has not *some* value. A year diligently spent in getting up heraldry would very possibly give a little insight into ancient manners and morals and into the origin of names. Anyone who should learn the distances between all the towns in England might, in the course of his life, find one or two of the thousand facts he had acquired of some slight service when arranging a journey. Gathering together

all the small gossip of a county, profitless occupation as it would be, might yet occasionally help to establish some useful fact — say, a good example of hereditary transmission. But in these cases everyone would admit that there was no proportion between the required labor and the probable benefit. No one would tolerate the proposal to devote some years of a boy's time to getting such information, at the cost of much more valuable information which he might else have got. And if here the test of relative value is appealed to and held conclusive, then should it be appealed to and held conclusive throughout. Had we time to master all subjects, we need not be particular. To quote the old song:

> Could a man be secure
> That his days would endure
> As of old, for a thousand long years,
> What things might he know!
> What deeds might he do!
> And all without hurry or care.

But we that have but span-long lives must ever bear in mind our limited time for acquisition. And remembering how narrowly this time is limited, not only by the shortness of life but also still more by the business of life, we ought to be especially solicitous to employ what time we have to the greatest advantage.

Relative values in arithmetic. *Variations illustrated by denominate numbers.* — Very simple and obvious examples of large differences in the social values of topics, all of which have some definite social value, are furnished by the tables of denominate numbers. For example, for city children the following facts certainly have very large social value:

12 things = 1 dozen
12 inches = 1 foot
3 feet = 1 yard

Less valuable, however, is the following fact, which is used not in daily measures but frequently by literary writers as a rough statement of amount:

20 things = 1 score

Still less valuable for ordinary city children are the following measures, which have large social value, however, in certain social situations where they are actually used:

6 feet = 1 fathom
6086.7 feet = 1 knot
16 cubic feet = 1 cord foot
8 cord feet = 1 cord

Automatic skill with fundamental operations socially very useful. — Similarly, in social life the ordinary operations in addition, subtraction, multiplication, and division of whole numbers and decimals have very much larger value than many of the special measures that are used to furnish concrete problems in school. There are always educators, however, who tend to decry the acquisition of skill in "abstract" number manipulation; skill in rapid, correct, automatic adding, subtracting, multiplying, and dividing. A study of social life quickly reveals the error of this point of view, since such skill is a useful tool in many social operations, industrial, commercial, scientific, etc. As a result of the large and clearly recognized relative value of skill in such automatic operations, schools in recent years have given much attention to *improved methods* of drill in arithmetic. *Increased time* is *usually not necessary*, however, as improved methods of specific drill quickly achieve the automatic skill in the fundamental operations which is desirable.

The most valuable topics determined by listing problems of ordinary citizens. — In an effort to determine precisely what phases of arithmetic have the largest value for ordinary citizens, Professor G. M. Wilson secured reports of the arithmetical problems which actually occurred in the lives of such citizens in Iowa, including architects, auctioneers, bankers, blacksmiths, bookkeepers, carpenters, contractors, farmers, housekeepers, laboring men, mechanics, merchants, printers, stock dealers, traveling men, etc. (7(*b*): 128–142.)

After analyzing and classifying the 5036 problems which were reported, the following facts appeared:

3128 problems involved buying (in many cases by housekeepers)
644 problems involved selling by the person reporting the problem
251 problems involved keeping accounts
217 problems involved percentage
79 problems involved "practical measurement"
56 problems involved cubic measure
41 problems involved discount
27 problems involved square measure
26 problems involved cancellation

Other social processes which ordinarily appear in arithmetic texts occur in smaller amount. It is obvious that buying and selling furnish most of the problems of these citizens and that keeping accounts and percentage furnish many more problems than do certain other activities. Most of the problems involved only one arithmetical process, and most of the numbers, figures, or quantities used contained less than four places. (7 (*b*) : 137)

Spelling lists determined by scientific investigations of relative values. — The above effort to determine the relative values of arithmetic problems by a precise, quantitative study of the number of times each type of problem occurs in the lives of ordinary citizens approximates a scientific method of determining relative values. Similar investigations which have been made concerning the relative needs of teaching different words in spelling have been carried so far that spelling books are now on the market which contain only the 4000 words which most children are likely to use in their writing in school or after graduation. They omit the 6000 or more words which have appeared in the ordinary spelling books for children, and which very seldom occur in the ordinary writing of children or adults. Such a practical application of the method of selecting subject matter on the basis of carefully determined relative values effects enormous social economy in schools by avoiding

the teaching of facts which are socially of relatively little value. So important are such investigations that we shall describe two of them, one a study of the theme-writing vocabularies of children and the other a study of the letter-writing vocabularies of adults.

Children's writing vocabularies; about 4500 different words. — In 1914 Professor W. F. Jones published the results of a "Concrete Investigation of the Material of English Spelling," based on the writing vocabularies of 1050 elementary school pupils in Illinois, Maryland, Iowa, and South Dakota. (**10**.) From 56 to 105 written themes were secured from each of these pupils on such topics as the following: in the second grade, "The Playhouse I should Like"; in the fifth grade, "What I did Last Saturday"; in the seventh and eighth grades, "The Study I Like Best" and "How I came to Tell a Lie." The writing of the themes extended over a long period, but in most cases by the time a child had handed in his fourteenth theme "the flow of new words had almost ceased." New words were then sought by varying the themes so as to reach into new and varied fields of experience, until each pupil's "word-well" had been pumped dry. In all the 75,000 themes, averaging 190 words per theme, *only 4532 different words were used.*

Discovered the spelling demons of the English language. — When the misspelled words were counted, "one hundred spelling demons of the English language" were discovered. The four arch-demons are shown in the following table:

"which," misspelled 321 times

"there" / "their" } misspelled 612 times when counted together

"separate," misspelled 238 times

From the complete list of spelling demons it appears that the words which gave the greatest difficulty in spelling throughout the grades are used by children in the second and third grades.

Relative values shown by relative frequencies and relative difficulties. — Thus Professor Jones's study provides two bases for determining relative values in teaching spelling: first, the relative *frequencies* of the words in children's writing vocabularies; second, the relative *difficulties* of these words as shown by the frequencies of *misspellings* throughout the grades.

Writing vocabularies of adults; 1000 most common words. — The second type of precise investigation of spelling vocabularies was an effort to determine relative values in the teaching of spelling by tabulating the words used in letters written by adults. Two important investigations of this type were made independently about 1913. One was made by Dr. Leonard Ayres of the Russell Sage Foundation, and the other by Professors W. A. Cook and M. V. O'Shea.

Ayres tabulated words from 2000 *short letters* written by 2000 different people, and found that *2001 different words were used.* (**8**)

Cook and O'Shea tabulated words from the *extensive family correspondence* of thirteen adults, and found that *5200 words were used.* (**9**)

By combining the results of these two investigations with results from other sources, Ayres selected a list of the 1000 most commonly used English words.

A series of spelling books based on above investigations. — Finally, the results of all this scientific investigation of everyday spelling vocabularies were incorporated by certain authors in a series of spelling books which were published in 1917. These books contain only 3448 different words to be taught from the first through the eighth grade. Other spelling books based on these scientific investigations have since appeared. The existence of these books makes it possible for every teacher to concentrate her emphasis in teaching spelling upon words that are used frequently, and to omit the useless wasteful teaching of words that are

seldom used in ordinary writing. Thus we have a very practical outcome from certain very simple but precise scientific studies of relative values.

Relative values in other subjects. — If space permitted we could extend the discussion of relative values (determined *scientifically* or *by opinion* from an examination of social needs) to geography, history, kindergarten activities, and other subjects. This task may be left to be undertaken by students in class in connection with such questions as the following:

If 100 minutes are devoted to the study of the Mississippi River, how many should be devoted to the study of the Hudson? the Connecticut? the Muskingum?

If 100 minutes are devoted to the period between the Revolutionary War and Washington's inauguration, how much time should be devoted to Monroe's administration?

Valuable aid in answering such questions may be secured from references **5** and **7** at the end of this chapter.

III. Characteristics of Scientific Procedure in selecting Subject Matter

Scientific procedure contrasted with personal opinions. — The investigations of spelling vocabularies which we have described may be used to show what we mean by *scientific* procedure and *scientific* conclusions as distinguished from mere opinions. This distinction was noted earlier in speaking of the opinions of Spencer and Dewey on pages 100–101.

Illustrated by spelling investigations. Scientific investigations are mathematically precise. — To the ordinary reader, one of the most striking facts about the spelling investigations is the use of exact mathematical statements; thus Jones had themes from 1050 pupils who used 4532 different words, the arch-demon "which" being misspelled 321 times; while Ayres from 2000 letters tabulated 2001 different

words. This fact furnishes the first characteristic of scientific method which we shall note; namely, it is *mathematically precise*. Scientific progress in education requires the use of precise mathematical statements just the same as does similar progress in physics or chemistry. In contrast, the opinions of Spencer and Dewey about education lack this mathematical precision.

Science uses objective data that anyone can examine. — A second feature of the spelling investigations is that they used materials or data that anyone could examine; Jones had the children's themes in hand, Ayres, Cook, and O'Shea had the adults' letters. From these sources, perfectly tangible material was tabulated; namely, the words used. Such tangible material is described as *objective* in contrast with mere impressions, feelings, ideas, or opinions which exist only in the mind of some thinker and are not open to general observation and manipulation. The purely mental materials are called *subjective*. A sunburnt person's statement that he feels hot and feverish would be called subjective, in contrast with the objective reading of the clinical thermometer which might show that his temperature is normal. Hence we have the subjective character of opinion contrasted with the objective character of scientific evidence.

Thus two characteristics of scientific procedure have been noted; it is mathematically precise and it is objective.

Scientific investigations can be verified because completely described. — The next feature disclosed by the scientific spelling investigations is that they can be repeated exactly by any competent person in order to determine if errors were made. For example, themes could be secured exactly as Jones secured his and his tabulations paralleled at every stage; letters could be secured as Ayres did his and similar tabulations made. In order that such repetition may occur it is necessary that each step taken in the investigation be *fully described*. Persons who merely give opinions, seldom

take the trouble to give such thorough accounts of the sources from which their opinions are derived. On the other hand, scientific investigations *can be verified* at every stage by any person competent to understand the description and duplicate the work.

Science employs experts trained in special methods of research. — The last sentence suggests a fourth characteristic of scientific study; namely, training in certain special methods of investigation. Among the spelling investigators, Ayres furnishes the best example. He has had years of training in scientific study, is employed as a research expert by the Russell Sage Foundation of New York City, and has made a notable success in organizing scientific school surveys on a large scale; for example, in Cleveland, in 1915, he had under his direction a staff of some twenty-five investigators, including some of the greatest experts in the country. His work illustrates the fact that scientific studies must be *made by experts* who are masters of the technique needed to determine the truth in the particular field under investigation.

Thus we have described four features of modern scientific procedure: it is (1) mathematically precise, (2) objective, (3) subject to verification by any competent observer, (4) used by experts.

Scientific investigators are impartial; they are not biased for or against. — The fifth and final feature of scientific procedure is its impartiality. In the spelling investigations, neither Jones nor Ayres allowed himself to be biased by his desire to prove that any particular word was more frequently used or misspelled than some other particular word. The desire of each investigator was to *find out*, to *discover*, what were the facts; they tried to be *impartial* in their work. Neither man had any particular reason for being otherwise; for example, neither had previously published a spelling book which contained many or few words and for which he wanted to secure larger sales.

Summary of characteristics of scientific investigations. — From the preceding paragraphs we may conclude that scientific investigations can be described as follows:

1. Mathematically precise.
2. Objective.
3. Subject to verification by any competent observer.
4. Made by experts.
5. Impartial.

Contrast of science and opinion summarized by Thorndike. — The contrast between the methods of science and the methods of opinion may be summarized in the above terms by quoting the following statements from Thorndike, from which these terms were derived.

Mathematical precision. — Science seeks precise quantitative measures of facts by which changes and correspondence may be properly weighed; opinion is content to guess at amounts of difference and likeness, to talk in the vague terms of "more" or "less," "much" and "little," to rate a method as better or worse without taking the pains to find out just how much better or worse it is.

Objectivity. — Science pays no heed to anything but the facts which it has already made sure of; it puts nothing in the scales but objective evidence. Opinion trusts its personal impressions.

Verifiability. — Science reveals the sources of its evidence and the course of its arguments, so that any properly equipped thinker can verify for himself the facts asserted to be true. Opinion offers itself to be accepted or rejected, but not to be verified.

Expertness. — Science is the work of minds specialized to search after truth. . . . Opinion is the occasional thought of those who, though important and capable people, are yet only amateurs in the work of getting truth [in the field in which their opinions may be offered].

Impartiality. — Science knows or should know no favorites, and cares for nothing in its conclusions but their truth. Opinion is often misled by the "unconscious logic of its hopes and fears," by prepossession for or against this or that book or method or result. (**6**: 265)

Utilize scientific conclusions in education when available. — As indicated on page 100 in discussing Spencer and Dewey, at the present time scientific facts are lacking to decide many educational problems. Even such a simple matter as the spelling vocabulary was not scientifically canvassed until about 1913. In the absence of scientific conclusions it is necessary to rely on the opinions of such notable students as Spencer, Dewey, and others. In the chapters that follow, however, we shall utilize wherever possible the results of mathematically precise, objective, impartial investigations, meager as these results still are in the field of methods of teaching.

Conclusion of discussion of social and relative values of subject matter. — This will conclude our discussion of the selection of subject matter. Working from the social point of view, we described social changes in American life which have necessitated radical changes in the teaching of oral and silent reading, arithmetic, religious-moral and civic-moral instruction and kindergarten activities. Following precise, objective, scientific studies we described the enormous variation in the relative value of topics in arithmetic and different words in spelling lists and then utilized the spelling investigations to illustrate the general nature of *scientific* procedure in selecting subject matter.

Having determined the principles which govern the *selection* of subject matter for schools, we shall turn in the next chapter to a discussion of the *organization* of the selected subject matter.

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CHAPTER V

ORGANIZING SUBJECT MATTER

Intensive Study; Psychological Organization

Main points of the chapter. — 1. Above the first grade, textbooks determine the *organization* of subject matter for most teachers.

2. Hence textbooks (as well as other materials of teaching) should be organized according to *sound principles*.

3. The *first* of these principles to be discussed is that subject matter should be organized around certain *large meaningful topics* instead of consisting of isolated encyclopedic details.

a. Hence, the old-fashioned crazy-quilt geography is being replaced by studies of important regions, industries, and geographical influences.

b. In history teaching, emphasis is being transferred to the vivid comprehension of large issues.

c. In the kindergarten, a superficial encyclopedia of trades is being replaced by a few large projects, such as a playhouse, a grocery store.

d. Such large topics give generalized knowledge which is widely useful.

e. Many related details are necessary to give vivid comprehension of large topics.

f. The details may be forgotten, but the general impressions, ideas, and methods of work should be retained permanently.

4. The *second* principle is that subject matter should be *organized as pupils learn it best*, not merely as determined from the subject itself.

a. Hence the chronological order in history is abandoned in the primary and middle grades in favor of a psychological order of topics beginning with familiar local events and vivid historical situations.

b. Such psychological organization of subject matter was proposed by Rousseau, who advocated studying childhood to determine the correct order of topics.

c. Instead of doing this, an alphabet of the elements of each subject was organized by Pestalozzi, who established the common A B C methods in reading, writing, drawing, and gymnastics.

d. Similarly, an A B C of geometrical forms was devised by Froebel for kindergarten children.

e. These A B C methods were based on the idea that children learn best by being fed the elements of subjects which have been dug out by the teachers and arranged from the simple to complex.

f. Modern psychology, however, shows that children learn best through their own efforts in analyzing complex meaningful objects or situations.

g. Hence, reading and writing begin with words or phrases or sentences, not letters and lines; drawing begins with representing ideas; and the kindergarten begins with projects instead of geometrical elements.

Relation to preceding discussion. — In the preceding chapter we considered the *selection* of subject matter from the social point of view and in the light of scientific methods of determining relative values. We shall now consider certain fundamental facts and principles which govern the *organization* of the selected material. The first point to notice in this connection is the large influence exerted by textbooks in determining both the selection and organization of subject matter in the case of many teachers.

Often textbooks determine organization above first grade. — In the course of our discussion of selecting subject matter we described the efforts which had been made to determine the content of arithmetic and spelling by precise, objective, scientific studies of social needs and relative values. In the case of spelling, we noted that this scientific effort had culminated in the production of spelling books which effected an enormous social economy by presenting only the words which are in common use. This type of achievement

is desirable in all subjects, namely, scientific determination of the subject matter which is socially most valuable and its effective organization into textbooks. This last step is especially important because most of the elementary teaching in America is textbook teaching. Such teaching varies from mere memory recitations upon the textbook to the most elaborate supplementing of the text. In the latter case the textbook often serves merely as an outline or summary for long discussions to which the teacher and pupils bring supplementary material from many sources. Usually except in kindergartens and first grades, *young* teachers are especially dependent upon textbooks, and this fact determines very largely their selection, organization, and use of subject matter.

Consequently textbooks should be carefully selected. — In view of these facts, it is important that teachers be guided in their choice of textbooks by sound principles of selecting and organizing subject matter. This is especially important in the middle grades, where textbooks and supplementary books are used in larger and larger quantities as the improved methods of teaching reading result in children being able to do quite rapid silent reading by the end of the fourth grade. In the kindergarten, since the children cannot read, the teachers cannot rely on textbooks, nor can they in the first and second grades for much of the work in community life and nature study. In such cases, however, the same principles apply in the organization of subject matter as in the case of textbooks.

Two principles: intensive study; psychological organization. — In this chapter we shall discuss two of the most important principles of organizing subject matter; namely,

I. The intensive study of carefully selected large topics, instead of the superficial encyclopedic study of many topics.

II. The organization of a subject psychologically, as children learn it most effectively, instead of organizing it merely in terms of the subject itself.

I. Intensive Study of Large Topics versus Encyclopedic Tendencies

In geography. Older geography teaching like a "crazy quilt." — The contrast between the superficial encyclopedic study of many topics and the organization of the study around a few large central topics or projects is most strikingly illustrated in the teaching of geography, in which the encyclopedic tendency often prevails. If you have ever seen an old-fashioned "crazy quilt," you have a good object in mind with which to compare the older methods of teaching geography and the mental impression of geographical facts which remained from such teaching. These "crazy quilts" were made by sewing together hundreds of little patches of cloth, little odds and ends of all colors. The similarity between these strange arrays of patches and the ordinary geographies was described by the great founder of modern geography, Karl Ritter, about 1820, as follows:

> [From the three traditional divisions, namely, mathematical, physical, and political,] our ordinary textbooks compile their usual aggregate of facts, and each becomes after its own pattern a motley in miniature. . . . A systematic exposition of geography is seldom to be found in them. . . . They are at the foundation only arbitrary and unmethodical collections of all facts which are ascertained to exist throughout the earth. . . . The facts are arranged as the pieces of a [crazy quilt], as if every one existed in itself and for itself and had no connection with others. . . . The beginning is usually made with *boundaries*, which are generally most unstable and uncertain, instead of being made with some rudimental fact around which all others arrange themselves as a center. . . . These geographical treatises . . . form a mere aggregation and index of rich materials, a lexicon rather than a true textbook. And therefore ensues, despite the undenied interest of the subject and its high claims, the mechanical and unfruitful method only too common — the crowding of the memory without judgment, without thought. (**3**: 342)

Hodgepodge of detailed information from older geography. — Doubtless the reader can easily call to mind illustrations of such geography teaching from his own experience. For example, in studying North America the dominant practice was to locate the capes, bays, and rivers, to bound all the states, to locate the capital and principal city of each state, to name the products of each, etc. In my own case I remember very vividly the awful confusion in my mind between the products of neighboring states when these were studied in the elementary school. For each state there was a paragraph containing the list of products. This had to be learned in each case and recited. No effort was made to emphasize the general characteristics of the region in which these states were located or the fact that they were merely convenient political divisions marked off in a region that was often largely uniform in its fundamental characteristics and products.

The outcome of such teaching was a general hodgepodge of more or less useful information with no comprehension of general geographic principles or large fundamental facts which would aid the pupil in further geographic study or in comprehending the world at large.

Contrast modern fourth-grade teaching of North America. — In contrast with the old-fashioned, crazy-quilt, hodgepodge type of geographic teaching, we may notice how North America is taught in a progressive fourth grade to-day, as set forth in the following quotation from the course of study of the Elementary School of The University of Chicago.

Pictures of great regions. — The study of North America is introduced by a succession of pictures of significant regions. These pictures are grouped to show scenes typical of the various parts of the country. The children see, for example, the rocky New England coast and the fishing fleet, some typical parts of the Appalachian Highland, the farms of the rolling prairie, cattle grazing on the plains, the high peaks of the Rockies, something

of the life in the mining camps, the desert of the Great Basin, the big trees of the Sierras, the orange groves of California and the cotton fields of the South. The presentation of this material covers several days. As the pictures are shown, the children locate the regions upon the globe and upon the large relief model of North America. Many of the pictures are projected upon the screen. The children are encouraged to discuss them freely, to ask questions, to tell "what that man is doing," to say "I have been there," and so on. They are encouraged to tell what place they would most like to visit and why, and to describe some of these places in writing and in sketches. They discuss both orally and in writing such points as "the differences the pictures showed between the eastern and the western mountains." In these studies the children are led to notice especially the changes in climate as evidenced by the vegetation.

Realize variety of places and industries. — At the close of this period of work the question is asked informally, "What have all of these pictures meant to you?" Among the replies, these are found: "I never knew the people were doing so many different kinds of work in North America," "I never knew North America was so big." In gathering up all the new ideas the children have gained of North America one large question is formulated in which the rest of the study centers, "Why has North America so many kinds of places and so many kinds of workers?"

Causes. — The first answer is, "Because of its great size and its different kinds of climate." From the globe the children discuss the time consumed in journeys across the continent. They see that the continent stretches almost from the north pole to the equator.

In the search for another reason the children gather about the large relief map of North America which is placed upon the floor. They notice the eastern and western highlands bounding the great trough or central valley. The two highlands are compared as to trend, length, width, height, and general character. The children note the parallel ridges of the Appalachians. They see that the Rocky Mountains are separated from the Sierras by the Great Basin. They trace the Cascade and the Coast Ranges. In doing this they are led to see that the topography is another force in determining the variety of places and kinds of work.

Having found two reasons, the children search for another. They recall regions of forests, of grassy plains, and of deserts, and discover that there are variations in rainfall. They find out from maps and pictures where there is little precipitation, where there is a great deal, and where there is a moderate amount.

Study influence of regions on industries. — The question now naturally arises, "What are all these places good for?" and the children begin to locate the important industries upon the continent. Farming receives first attention. They know that some of the best farm lands are in river valleys. Several of the great rivers of North America are studied to find which basins offer the best opportunities for farming. The following questions are considered:

1. What part is the main stream and what are its most important tributaries?

2. Where do these streams rise and into what does the main stream empty?

3. What is the climate of the region through which this stream flows?

4. Does the climate vary in the different parts of the basin, and if so, how does this affect farming?

Some of the rivers studied in this way are the Mississippi, Missouri, St. Lawrence, Columbia, Sacramento and San Joaquin, Colorado, Mackenzie, and Yukon. The pupils find what in a large way are the most important crops of different parts of the continent. This establishes the idea of the wheat, corn, and cotton lands. The other important industries are indicated on the large relief map as their location is learned. The detailed study of these industries is postponed until the second semester. (**7**: 16)

Such improved teaching possible by young well-trained teachers. — To one who knows only the old-fashioned encyclopedic geography teaching, the above account probably sounds far-fetched and impossible of realization in an ordinary fourth grade. Yet an examination of the most recent geography textbooks reveals the same type of materials and organization. Any intelligent normal-school graduate who has been given two years of good specialized training for

teaching in the middle grades could carry out effectively in a well-equipped school, using the best modern texts, such a method of teaching North America as that described above.

Large significant topics in which this teaching centers. — For our present purposes we are interested in the way this teaching centers in certain large significant topics. In reviewing the description we notice the following examples of such large topics:

1. Great *natural regions*, such as great mountain systems, great plains, great river basins, tropical regions, temperate regions, frigid regions, etc.

2. Great *industries*, such as fishing, farming, lumbering, mining, or, in more detail, wheat raising, cotton growing, coal mining.

3. Great *geographical influences*, such as the influence of climate on agriculture, the influence of topography on climate, the influence of river basins on agriculture.

Large topics give generalized knowledge, widely useful. — The type of knowledge which the children acquire from these great topics differs in two fundamental respects from the hodgepodge of details acquired in the old-fashioned geographies. (1) The large topics give first such an *understanding of North America* that the child would know the opportunities, possibilities, and needs in living in each region if he had occasion to travel there or read further about it. (2) The large topics give in the second place such a *general understanding of industries and of geographical regions and influences* that he can comprehend easily these fundamental facts wherever he encounters them in school in the study of any continent, or in after life in any part of the world. For example, after a child has been through a modern elementary course in geography he would be able to understand readily the fundamental geographical influences and social possibilities in some region of current interest, such as Russia or Mesopotamia, or comprehend easily such

an important international fact as the value to Germany of the Berlin-to-Bagdad railroad.

Varied activities in intensive study of a topic. — In the study of each large topic it is approached from many points of view. For example, in studying *lumbering* the following activities are carried on: (1) discussions of values of forests; (2) maps of national forests examined; (3) letters written to National Bureau of Forestry for maps and booklets, the best letters chosen to be sent by a committee; (4) enemies of the forests, such as forest fires, studied; (5) great forest regions colored with crayon on outline maps; (6) specimens of wood collected and characteristics noted; (7) magazine articles and pictures brought by children; (8) logging and lumber camps of the North contrasted with those of the South through pictures; (9) important shipping centers for lumber indicated on wall map and marked on individual outline maps; (10) "Lumber Books" made with cover designs and illustrations drawn, such as A Logging Camp in the North, A Flume; (11) compositions written on "The National Forests" etc.

In project teaching pupils plan these activities. — When the pupils are given considerable part in planning such practical activities as are described above, we have what may be called project teaching. Such planning frequently involves considerable investigation and discussion by the pupils and the devising of ways and means of solving the practical problems which the various activities present. Effective direction by the teacher of such problematic activities by the pupils frequently calls for very wide knowledge on her part and for great resourcefulness in meeting various issues and needs as they arise. For this reason a teacher who undertakes project teaching should have a very thorough understanding of the possibilities and intricacies of each project that she expects the pupils to undertake and of the elements of skill in such teaching. (See Chapter XII.)

History illustrates change to vivid comprehension of large issues. — The teaching of history illustrates the same change from encyclopedic, unrelated detail to the thorough study of a few large central issues. Thus Columbus and the European situation which sent him forth may be treated thoroughly, while many of the minor explorers are omitted;

EQUIPMENT FOR KINDERGARTEN PROJECTS

From The University of Chicago Elementary School. Notice the large screen playhouse in the left background. It can be easily moved to any part of the room. Compare the picture on the opposite page

certain important problems in American history, such as the slavery problem, may be traced from beginning to end, but separate study of many of the presidential administrations omitted. The study of Roman history in the fourth grade presents one of the most striking examples. If ever there was an encyclopedic hodgepodge, it existed in much of the teaching of Roman history in American high schools. Obviously such a study could not be carried on with fourth-grade children. Instead, a few typical scenes and events are selected and made real to the children. For example, many days may be spent on "Horatius at the Bridge,"

until the children live in imagination the Roman scenes and perhaps dramatize them. Similarly, many days may be spent on Cæsar and his exploits, to get a vivid impression of another important period in Roman life. See the frontispiece and the pictures on pages 8, 132, 134, 136, 138, 230, and 232, for illustrations of historical projects.

EQUIPMENT FOR KINDERGARTEN PROJECT

From the Bradwell Public School, Chicago. Screen playhouse set for Christmas Eve. Notice the fireplace and stockings. This screen is of less expensive construction than the one shown on the opposite page. See discussion on page 126

Supplementary books provide material for intensive study. — It often happens that the fundamental texts in both geography and history lack sufficient detail to give reality to the large significant topics that the teacher desires to emphasize. Fortunately a wealth of supplementary reading material is now available in the form of geographical readers, industrial geographies, stories of Ab and Jiji and other pseudo-historical children, stories of the Greeks, Romans, vikings, and other peoples, biographies of great men of all nations, etc. In many school systems such supplementary books are provided from the superintendent's office or public

Courtesy of The University of Chicago Elementary School

COÖPERATIVE KINDERGARTEN PROJECT IN THE STUDY OF COMMUNITY LIFE

For the story of this picture see opposite page, and discussion on page 127

libraries in large quantities. In all cases teachers should secure from the large textbook companies catalogues of their supplementary books and should examine their exhibits at teachers' institutes or wherever they are found, in order to become familiar with the most suitable books for the intensive study of each large topic.

A few kindergarten projects replace encyclopedia of trades. — As a final example of the change in organizing subject matter from the encyclopedic tendency to the use of large central topics or projects, we may note the change which is taking place in the kindergarten subject matter. In endeavoring to carry out Froebel's idea that the kindergarten should introduce children to community life, the old-fashioned kindergarten included in its program a list of all the trades practiced in the community, such as the wood-chopper, the carpenter, the charcoal burner, the coal dealer, the blacksmith, the baker, the shoemaker, the postman, the fireman, etc. These were taken up in order, each for a few days, and as a consequence children finished the year with a confused jumble of ideas derived from a hurried Cook's tour through human industries. After observing such a

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Story of the picture on opposite page. — The construction of a community project is represented in this kindergarten picture; namely, a street with its various dwellings and other features. Notice the children working singly and in pairs. Into their co-operative work has entered a variety of problems; for example, making the paper bases to support the street lamps and the trees, the symmetrical arrangement of the street lamps, the locating of the trees, etc. Incidentally, the picture shows an attractive kindergarten room, with lockers and a bench around the wall, the top of the lockers forming a shelf for the plants, etc. On the wall are large pictures especially suited to kindergarten children; pictures in bright colors, with prominent figures; pictures that tell a story, such as Little Red Riding Hood with her basket meeting the wolf in the woods.

program in operation in a typical conservative kindergarten, Miss Alice Temple wrote as follows:

> [While] there is no criticism to be made of the selection of some of these forms of industrial or civic occupation, [there] are objections . . . to using them in the manner described. There is an attempt to cover too much ground. The children are introduced in the course of a few weeks to too large a number of objects, processes, and ideas. The treatment is, in consequence, very superficial. . . . There is not time for the children to become acquainted with the material. (**5**: 28)

In place of such an encyclopedia of trades, modern progressive kindergartens organize their activitives around a few large projects, such as a large playhouse, a grocery store, or a dry-goods store. In speaking of these Miss Temple says:

> The accompanying photographs illustrate the objective expression of group projects which have proved most valuable as a means of holding interest and organizing activity for relatively long periods of time; say, five or six weeks.
>
> *Playhouse.* — The playhouse (shown in the pictures on pages 16, 122, and 123), as the center of housekeeping plays, supplies motive for building necessary furniture, for making bedding, table furnishings, kitchen utensils, and window curtains. The objects to be made are so familiar that the children have definite ideas to start with, and, given some suggestion and suitable material, they are able to work with relative independence. The intense interest in the project stimulates the children to put forth their best efforts in planning and in making the necessary objects. The variety of things needed calls for the use of a variety of materials, and the objects made must stand the test of use in play. The children are thus enabled to judge their own products.
>
> *The grocery store.* — The building and equipping of a grocery store like that shown on page 127 is a project still richer in possibilities. It necessitates excursions to the store to learn how and with what it is stocked. It calls for a quantity and variety of provisions. It suggests dramatic plays of buying and selling, and its relation to the home (represented by the playhouse) is expressed

through these plays. Wagons and baskets need to be constructed to deliver the groceries satisfactorily, and the buyers need pocket-books and money to pay for them.

Community buildings. — The groups of community buildings represented on pages 124 and 129 are the objective expression of community needs and relationships. They show many houses, a school, a church, some stores and shops, the street, street lights, automobiles, etc. (**5**: 36–37)

KINDERGARTEN PROJECT — GROCERY STORE

Constructed from light fruit boxes covered with paper. From the Myra Bradwell School, Chicago. Similar stores are often constructed of large building blocks

Real relations of social activities appear in large kindergarten projects. — It is clear from these descriptions that Froebel's fundamental idea of familiarizing children through play with home and community activities is not neglected by this project method of organizing kindergarten activities. On the contrary, the descriptions show that these projects provide the most vivid kind of active experiences with typical social activities in very real and natural relations to each other.

Values of study of large topics summarized. — Thus by examples from geography, history, and kindergarten activities we have illustrated the tendency to discard the

encyclopedic organization of subject matter and to substitute the organization around a few large topics, each of which is a significant unit in which the pupils center a great variety of activities for several days or weeks. In each case the value of this type of organization was commented on. These values may now be summarized as follows:

Such intensive study of large significant topics results in

1. *Vivid impressions* by the pupils of important topics; for example, of old Roman life, of lumbering, of irrigation.

2. Better *understanding* of important *relations*; for example, between stores and homes, or natural resources and industries.

3. Training in *gathering and organizing material* for large enterprises; for example, for a store or a play.

4. Training in *using general ideas* in interpreting new situations; for example, in studying a new country in geography.

5. A *permanent memory* of useful general impressions, ideas, and methods of work which may be used by the pupils in after life.

The memory element mentioned in paragraph number 5 was not discussed in connection with the examples. Hence we shall consider it further at this point.

Intensive method focalizes large significant issues to be remembered.— It is commonly said that nine tenths of what we learn in school is forgotten. This is probably true. Therefore it is especially important that some method be adopted that will assure that the one tenth that is remembered is worth remembering. As long as encyclopedic, unrelated, unorganized details are taught, the part that will be remembered depends largely on chance. On the other hand, if large fundamental issues are emphasized, and the details so selected as to bring these large issues to a clear focus, we may feel reasonably sure that these will be the parts that will be remembered.

Many details necessary to make general issue real.— There may be as many details in the intensive method as

in the encyclopedic method, but their character and purpose is different. For example, when fourth-grade children spend their history periods for two or three weeks on "Horatius at the Bridge," scores of details of Roman life are brought out. But these details all fit into the general picture that is being created in their minds of Rome in "the brave days of old," when "Romans were like brothers," when "none was for a

KINDERGARTEN PROJECT — COMMUNITY BUILDINGS

From the Ray Public School, Chicago. Compare the picture on page 124. See discussion on page 127

party," but "all were for the state." Similarly, a few weeks later, when many hours are spent in studying Cæsar, the details serve to give a vivid lasting impression of Roman life in Cæsar's day and of the personality and achievements of one of the greatest figures in history.

Details used in intensive study to support the general meaning. — Thus we see that the details used in the intensive study of large topics are carefully selected and arranged for the purpose of contributing to the better understanding of these general topics. The details may be spoken of as *supporting* the general principle, fact, or impression. Thus

they make the matter under consideration meaningful — they fill it with meaning. In the encyclopedic treatment of many topics, on the other hand, we find thousands of details that are more or less isolated in character. They do not contribute to form a general impression or general idea, but often seem to be all on the same dead level of insignificance.

Details to be forgotten; general meaning remembered. — In the intensive study of large topics, while the details are necessary to build up the general impression or meaning, they do not constitute this meaning. For example, the details of dress, of action, of enunciation, etc. used in dramatizing the Horatius incident help at the time to give the impressions of Roman plebeians and patricians united in the defense of Rome. But this general idea does not consist of these details. Long after these are forgotten the general idea may persist and be used in thinking about other plebeian and patrician situations, such as the Bolsheviki fighting against the bourgeoisie of Russia in 1917 instead of uniting with them against the common enemy. Once the details have served their purpose of building up a vivid general impression or meaning they may be forgotten, and many probably should be forgotten for purposes of mental economy. The general meanings or ideas or impressions should remain permanently, however, for use in later experiences. They constitute the important permanent products resulting from the organization of subject matter in terms of large topics or projects, which is the first principle of organizing subject matter to be discussed in this chapter.

Limitations of intensive method. — The intensive method of organizing subject matter has been illustrated in the above discussion with examples from geography, history, and kindergarten activities. Examples could also be given from the teaching of English, nature study, and manual training. In these subjects *much* of the material (though not all) may be easily arranged under large topic headings. In some

subjects, however, notably in spelling, handwriting, music, formal drill in arithmetic, and in the reading of short stories, the intensive type of organization has little place. In these subjects, the second principle of organizing subject matter which we shall consider plays a larger part in determining the organization; namely, the principle that subject matter should be organized in terms of the pupils' interests and capacities for learning.

II. Organization in Terms of the Learner instead of in Terms of the Subject

In history. — One of the simplest and clearest examples of the organization of subject matter as children learn it best, instead of organizing it in terms of the subject, is found in the teaching of history.

Chronological organization. *Subject seems to demand it.* — A historian almost always organizes his material in *chronological* order. The relationships between historical events, the ways in which certain events grow out of others, seem to dictate the chronological procedure. For example, the American Revolution grew out of the inheritance from England of certain principles concerning liberty, and the violation of these principles by the English home government. Consequently, in order to present the Revolution properly it would seem to be necessary to describe antecedent English and colonial conditions. Thus, the order of history teaching as determined by the subject itself is nearly always chronological.

Little children have no understanding of long periods of time. — When we come to teach history, however, to children in the primary and middle grades, the question arises whether the chronological connections over long periods of time constitute the proper basis for organizing the subject there. It soon becomes apparent that periods of years mean

Courtesy of The University of Chicago Elementary School

ILLUSTRATION OF COURSE OF STUDY IN PRIMARY HISTORY

First-grade children designing Indian costumes for a play. See story on opposite page

little or nothing to children who have lived only eight or ten years. Practically the only definite feelings of years that such children have are associated with the idea that "last year" they were in Miss Smith's room, and a more vague notion that the "year before" they were in Miss Brown's room in school. Evidently, with such an uncertain basis for understanding periods of time the chronological order does not seem necessary or desirable.

Social needs and activities also uncomprehended. — Moreover, primary children lack not only an understanding of periods of time, but they lack also the social experiences necessary for an understanding of the lives of people remote in space or time. Consequently, before beginning to teach them about the lives of their European and American ancestors it is necessary to give them some understanding of the fundamental social needs and activities of the people of to-day. Hence a modern course in primary history begins in the kindergarten and first grade with a study of the social

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Story of the Indian pictures on pages 132, 134, and 136. — These pictures illustrate the activities of the first-grade children who are studying Indian life as described in the course of study quoted on page 135. They have been reading stories of Ji-Shib and Hiawatha in their reading periods. For their language work, they constructed and presented a little play. In the picture on page 132 they are shown designing the costumes for the play. A child has written on the blackboard that they went to a neighboring museum to examine the costumes. Other suggestions were secured from pictures of Indians. The picture on page 134 shows the children performing one scene of their play in their classroom, while the picture on page 136 shows them presenting the play to the school assembly during morning exercises. These pictures illustrate not only the study of the social life of the Indians as a part of the course of study, but also the utilization of the children's interests in adventure, imitative play, manipulation, and communication as the basis of social studies and of training in expression.

Courtesy of The University of Chicago Elementary School

FIRST-GRADE CHILDREN PRESENTING INDIAN PLAY IN CLASSROOM

See story of this picture on page 133

situations with which the children are in *direct contact* in order to prepare them to understand *historical* social situations.

History course as adapted to children. *Activities of home, community, and farm studied in kindergarten and first grade.* — The nature of the kindergarten study of social activities was brought out in the description of the playhouse and other projects given on page 126. For city children the first step away from the *immediate* social environment is taken in the first grade through a study of farm life. In addition to many other devices, in The University of Chicago Elementary School, the following methods are used:

A miniature farm is set up on the sand-table. The various buildings are constructed from cardboard, fields of grain are sown, fences and trees made, toy animals provided, and the pictures made as complete as possible. The sand-table is a source of much imaginative play, and the children's initiative is encouraged in planning and in acting out their various farm experiences with the material available. Here they have an opportunity to retell the stories of farm life which have been told them and to invent new ones.

Each child also plans and makes a Farm Book. The following materials are used: (1) pictures which the children collect from various magazines and farm journals; (2) illustrations which they have made; (3) paper cuttings; (4) explanatory sentences which they add whenever necessary. All this material is arranged by the children with the help of the teacher. The Farm Book is thus a constant help in organizing and using their knowledge of the subject. (**8**: 406)

Indian life provides second step toward imagined, historical, social situations — After completing the farm project, the second step in the study of remote or imagined social situations may be taken in the first grade by a study of Indian life. (See the pictures on pages 132, 134, 136.)

The basis for the study of Indian life is found in Jenks's "The Childhood of Ji-Shib, the Ojibwa." This story, in which the life of an Indian is portrayed, gives most of the phases of Indian life

Courtesy of The University of Chicago Elementary School

INDIAN PLAY AS FINALLY PRESENTED ON STAGE TO SCHOOL ASSEMBLY BY FIRST-GRADE CHILDREN

See story on page 133, and pictures on pages 132 and 134

desirable for presentation to children. With this story as a basis the teacher is able to present the subject in a concrete way, contributing details wherever needed and rearranging parts to suit her needs. On the sand-table or in the individual sand-pans the children reproduce parts of the story of Ji-Shib and work out new adventures suggested by it. They make an Indian Book, in which are kept their drawings and paper cuttings.

In addition to its being a much-treasured record, this serves as a means of organizing the work and giving motive to the reproduction of parts of the story. They carry out some of the activities of Indian life, such as the threshing and grinding of grain and the parching of corn. They dramatize many of the Indian activities: hunting, fishing, moving, feasting, dancing. They play many of the Indian games. (**8**: 408)

Shepherd life and Viking tales further enrich social imagination. — In the second grade the study of shepherd life introduces the children to activities and customs that will aid them in understanding many peoples, such as the Arabs and the dwellers in Palestine. In the third grade a strongly contrasting type of civilization is introduced by a study of Jennie Hall's "Viking Tales," supplemented by constructive activities. The sea life, adventures, and travels of the hardy Vikings are vividly presented. (See the picture on page 138.)

Local history introduces chronological development. — At the end of the third grade or the beginning of the fourth, local history is studied. The growth of the local settlements gives the children concrete notions of actual chronological changes in social conditions, thus introducing them to a historical series of events in a concrete, close-to-home manner. For example, the study of the local history of Chicago traces the growth of the city from its settlement as Fort Dearborn, a trading and military post, down to the present time. The textbook is Jennie Hall's "Story of Chicago." The activities of the class during the study are suggested by the contents of the "Chicago Book" which each child makes and which contains written descriptions,

Courtesy of The University of Chicago Elementary School

VIKING ACTIVITIES, SHIPS, AND HOMES BEING REPRESENTED BY THIRD-GRADE CHILDREN

See story on opposite page, and course of study on page 137

original stories, bits of dramatization, sketches which are made in the art period, and pictures which he has collected as illustrations.

The following table of contents is copied from such a book, together with explanatory notes.

TABLE OF CONTENTS

1. Lake Michigan (a picture).
2. Before White People Came (written description).
3. Early Chicago (a map which was first made on the sand-table).
4. Making the Portage (a sketch).
5. Trading Posts (written composition).
6. The Indian Council (mimeographed record of dramatization).
7. Fort Dearborn (picture).
8. Building Fort Dearborn (written composition).
9. Why People Thought Chicago would be a Big City (written composition).
10. Pack Horse (a sketch).
11. How Pioneers Travelled (written composition).
12. Prairie Schooner (a sketch).
13. How People Travel To-day (written composition).
14. Pictures of Street Cars, Trains, and Automobiles.
15. People whom Chicago Honors (mimeographed papers).
16. Chicago Harbor (map).
17. The Pioneer (verse).

Story of the picture on opposite page. — The ships, weapons, homes, occupations, dress, and pastimes of the Vikings, as well as their adventures and explorations, are being studied by the third-grade children shown in this picture. In the large sand-pan the children have constructed a Viking feast hall and other buildings with thatched roofs. On the wall are hung drawings of Viking boats made during the art periods. Models of the boats are made and placed in the harbor in the sand-pan. The children at their desks are modeling the rugged physical features of Norway with the fiords and mountains.

18. Pioneer Times: the Country Store; Lighting; Heating and Cooking; the Mail; the Water Supply (compositions).
19. The Tunnel and Crib System (compositions and diagrams).
20. Purifying Water (written record of experiments).
21. Things which Helped to Make Chicago a Big City (written composition).
22. Beautiful Chicago (pictures).
23. Plan of the City. (**8**: 426)

The knowledge of the growth of their home city prepares the children for an understanding of the growth of historical cities such as Athens and Rome.

Greek and Roman adventures. — In the fourth and fifth grades the lives of the Greeks and Romans furnish materials for further enrichment of the pupil's mental storehouse of historical pictures and personages, — Homeric adventures, thrilling battles at Thermopylæ and Marathon, Greek fleets, Greek buildings, Alexander's conquests, simple Roman beginnings, Horatius at the bridge, Cæsar, etc.

Chronological connections begin to receive emphasis. — From this point the chronological connections may receive more and more emphasis, but it should always be kept in mind that appreciation of long periods of time is a difficult achievement even for adults, to whom such expressions as the fifteenth century and the Renaissance often carry little meaning. Even to give a coherent, connected, lasting impression of the succession and relation of events in a single century requires special art on the part of the teacher.

From chronological to psychological organization in history. — The preceding paragraphs present a contrast of the chronological order of topics and what we may call the psychological order. Notice the word "logical" appears in both these terms. "Chrono-logical" means *time* organization. "Psycho-logical" means what? It means organization according to the *mental progress of the learner.* It means the

order that is determined by the way in which the *pupil learns most readily and effectively.* It means omission of materials and ideas that children cannot comprehend at any given stage in their maturing or training, and careful choice for each stage of activities that the children can understand and master. It means *adaptation of subject matter to the capacities and interests of the pupils.*

History of efforts at psychological organization explains present practices. — The substitution of a psychological organization of elementary-school subject matter for forms of organization determined merely by the subjects themselves constitutes a continuous trend of improvement in elementary school teaching since 1800. Inasmuch as many persons still adhere to the practice of organizing material regardless of the order best adapted to pupils, and since many efforts to determine the best psychological order have been mistaken, we shall review briefly the historical changes through which the leaders in educational thinking have arrived at the present point of view. We have found this historical procedure helpful in earlier chapters, especially in presenting the social point of view as represented by two great educational writers, Spencer and Dewey. The social point of view and the psychological idea of organizing subject matter as children learn it best constitute the two great features of modern pedagogy. In presenting the history of the psychological effort we shall introduce three other great educational thinkers. The first of these is Rousseau (Rōō-sō′), the firebrand of the French Revolution of 1789, one of the most influential figures in modern history.

Rousseau said study childhood to determine organization of teaching. — Among Rousseau's notable writings was an epoch-making book on education, published in 1762, in which he described the training of an imaginary boy, "Émile" (Ā-mēēl′), after whom the book is named. In

the preface of it Rousseau formulated his purpose in the following words, which summarize the psychological point of view in teaching:

> We do not know *childhood*. Acting on the false ideas we have of it, the farther we go the farther we wander from the right path. Those who are wisest are attached to what is important for men to know, without considering *what children are able to apprehend*. They are always looking for the man in the child, without thinking of what he was before he became a man. This is the study upon which I am most intent. . . . *Begin, then, by studying your pupils more thoroughly*, for it is very certain that you do not know them. Now, if you read this book of mine with this purpose in view, I do not believe that it will be without profit to you. (**3**: 187)

Rousseau set Pestalozzi on fire. — Hundreds of thousands of persons did read Rousseau's "Émile," for he was a wonderful writer, a great literary genius. Many of these condemned the book, but many others were inspired to a remarkable degree by its powerful message. Among those who were set on fire was a humble Swiss university student named Pestalozzi, who said:

> The moment Rousseau's "Émile" appeared, my visionary and highly speculative mind was enthusiastically seized by the visionary and highly speculative book. I compared the education which I enjoyed in the corner of my mother's parlor, and also in the school which I frequented, with that which Rousseau demanded for the education of his Émile. The home as well as the public education of the whole world and of all ranks of society appeared to me altogether as a crippled thing, which was to find a universal remedy for its present pitiful condition in Rousseau's lofty ideas. (**3**: 274)

Pedagogical pilgrims flocked to Pestalozzi's schools, 1800–1825. — After many years of toil and hardship, this humble Swiss student became the greatest and most influential practical educator of modern times, and to his experimental schools, maintained in Switzerland from 1800

to 1825, pedagogical pilgrims, statesmen, and tourists flocked from all over the world. The serious-minded went there to learn from Pestalozzi; the frivolous and curious went as they would flock to see a lake or a glacier.

ROUSSEAU, REVOLUTIONARY LEADER OF MOVEMENT TO ORGANIZE SUBJECT MATTER ACCORDING TO PUPIL'S INTERESTS AND CAPACITIES

Pestalozzi desired to psychologize teaching; methods widely used. — Pestalozzi's influence in changing methods of teaching in elementary schools was as great as his fame. To him and his followers we owe some of our best present-day practices in teaching arithmetic, geography, and nature study. An equally profound influence was exerted upon the methods of teaching reading, writing, drawing, and gymnastics. In all these reforms Pestalozzi's slogan was, "I desire to psychologize teaching." As indicated above, his psychologizing was very helpful in *some* subjects. Unfortunately, he was quite mistaken in his efforts to psychologize the teaching of reading, writing, drawing, and gymnastics, and his false methods in

these subjects, as well as some of those developed in the kindergarten by his disciple Froebel, have persisted in common use until recent years and are still followed in many places.

"From simple to complex" led Pestalozzi astray; alphabet methods. — The idea which led Pestalozzi astray in his methods of teaching was the apparently harmless statement that teaching should "proceed from the simple to the complex." Pestalozzi interpreted this statement to mean that in each subject an alphabet of the elements of it should be organized, just as there is an alphabet of letters used in reading. Pestalozzi called these alphabets his "A B C's." In describing his earliest efforts to use them with primary children in school, he said:

> I once more began crying my A B C's from morning to night. . . . I was indefatigable in putting syllables together and arranging them in a graduated series. I did the same for numbers; I filled whole notebooks with them; I sought by every means to simplify the elements of reading and arithmetic, and by grouping them psychologically [to] enable the child to pass easily and surely from the first step to the second, from the second to the third, and so on. The pupils no longer drew letters on their slates, but lines, curves, angles, and squares. (**3**: 365)

It appears from this quotation that Pestalozzi's notion of psychologizing the teaching of a subject was to break it into its elements and then to feed these elements in regular order to the pupils. Hence, he said:

> In every branch of popular knowledge or talent, I set to work to organize a graduated series of exercises, the starting point of which was within everybody's comprehension, and the unbroken action of which, always exercising the child's powers without exhausting them, resulted in a continuous, easy, and attractive progress. (**3**: 366)

Phonic alphabets used in beginning reading and spelling. — In the teaching of reading and spelling he made his alphabet

from the elementary sounds of the language. Speaking of this work, he said:

> The spelling book must contain the entire range of sounds of which the language consists, and portions of it should be repeated daily in every family. . . . No one imagines to what a degree the attention of infants is aroused by the repetition of such simple sounds as *ba, ba, ba, da, da, da, ma, ma, ma, la, la, la.* (3: 367)

Lines and angles constituted elements in writing and drawing. In teaching handwriting, he found the elements in "lines, curves, angles," etc., and, as suggested in the quotation above, "the children no longer drew letters on their slates," but drew these elements instead. The same elements served as the starting point for teaching drawing.

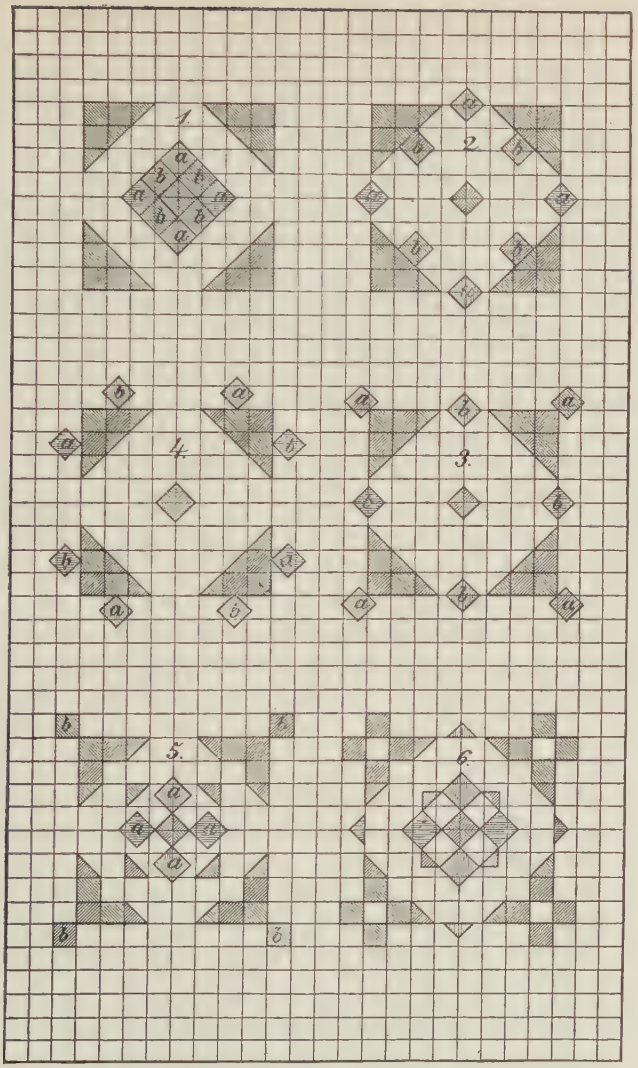
These methods still used in some places. — The reader will recognize in these descriptions the methods of teaching reading, writing, and drawing which are still in vogue in some parts of the country, — beginning with letters or elementary sounds in reading, and with practice in drawing straight lines, curved lines, ovals, angles, squares, etc. in handwriting and drawing. The predominance of such methods during the nineteenth century was largely due to the work of Pestalozzi and his followers.

A B C of gymnastics gave calisthenic systems still widely used. — The systems of gymnastic exercises in which children perform all kinds of elementary movements also originated in the Pestalozzian theory of organizing an alphabet for each subject. To exercise the arms properly, according to this theory, they must be moved up and down, backwards and forwards, in straight lines and in circles, in all possible ways. Similarly, with the legs the same process should be carried out. After all the "elementary" movements have been mastered, then more complex combinations are practiced, eventually resulting in complicated contortions involving simultaneous use of all parts of the body. The

reader will recognize that such calisthenic systems are still widely used in the gymnastic training of children.

The A B C of observation emphasized geometrical names. — One of the most remarkable applications of the Pestalozzian theory of proceeding from the simple to the complex was in the teaching of geometrical figures and names. Rousseau and Pestalozzi had created an enthusiasm for the *observation* of things, and since squares, circles, angles, triangles, etc. appear in doors, windows, street corners, etc., Pestalozzi and his followers concluded that an alphabet of these had to be taught, so they devised "A B C's of observation." The Pestalozzian object-teaching books which had great vogue in England and America about 1860 included in their material for "infant and primary schools" not only the simpler geometrical names such as the cylinder, cone, sphere, hemisphere, etc., but even such appalling names as tetrahedron, octahedron, and rhombic dodecahedron.

A B C of kindergarten exercises based by Froebel on geometrical forms from simple to complex. — Pestalozzi's theory of proceeding from the simple to the complex was applied by his disciple Froebel in organizing the activities used in play and construction in the kindergarten. Froebel spent two years as a teacher or observer in Pestalozzi's school and said, "It soon became evident to me that 'Pestalozzi' was to be the watchword of my life." After many years of vicissitudes, Froebel finally organized the first kindergarten in 1837. At an earlier date he had emphasized "proceeding from the simple to the complex" in the organization of constructive activities, and later, in speaking of the use of games in the kindergarten, he said, "They should be organized in 'logical sequence.'" These ideas, combined with the general enthusiasm for geometrical names described above and Froebel's experience with geometrically formed crystals while working as a mineralogist, resulted in a most peculiar series of play devices for educating



OLD-FASHIONED "SIMPLE-TO-COMPLEX" KINDERGARTEN CONSTRUCTIONS

"Forms of beauty" made with Froebelian blocks. Note the contrast between this picture and the socially meaningful activities of progressive kindergartens pictured on pages 123–129 and 154

children. Throughout these devices the geometrical idea stands out. Instead of choosing dolls and doll clothes and toy furniture and other socially meaningful objects found in children's imitative play, he chose a ball because it was a sphere, blocks because they were cylinders and cubes, little sticks because they could be laid into geometrical forms such as triangles, squares, rectangles, etc. The use of these objects in constructing geometrical "forms of beauty" is shown in the picture on page 147. It is evident that you proceed from the simple to the complex as you glance from the upper part of the picture to the lower part.

Teaching of formal subjects long dominated by Pestalozzi's unpsychological alphabet methods. — The examples from the teaching of reading, writing, drawing, gymnastics, and the kindergarten show what an enormous influence has been exerted in the teaching of these formal subjects by the principle of proceeding from the simple to the complex. In many places the methods described are still in vogue. It remains to show that Pestalozzi was badly mistaken when he decided that the way to psychologize teaching was to break up each subject into its smallest elements and then feed these elements to children in "logical sequence."

Pestalozzi's alphabets based on the subjects, not on childhood. — It will be remembered that we defined the psychological organization of subject matter as the order in which pupils best learn a subject, and that Rousseau laid the foundation for the psychological reforms by saying we must study childhood to understand how children learn most readily and effectively. Now it is quite obvious that while Pestalozzi said he would "psychologize teaching," he frequently forgot "childhood" in the practices described above and focused his attention absolutely on each subject in itself. Disregarding children's experience and natural methods of learning, he devised the most unpsychological schemes for having them learn. This may be explained by presenting a partial

description of the way a person learns according to William James, the greatest of American psychologists.

Learning usually involves the learner's analyzing complex wholes himself. — According to James, a person learns ordinarily by meeting complex situations and *analyzing these situations himself*, not by being fed the elements of these situations by someone else who has dug them out. In describing the frame of mind of a child in a very new situation, James characterized it as "a big, blooming, buzzing confusion." Examples of such situations from adult life are the following: coming out of a depot in a strange city; being plunged into the water for one's first swimming lesson; trying to draw an unfamiliar object if you have little skill in drawing; trying to solve a difficult original exercise in geometry. The learner clears up such a buzzing confusion by picking out now this phase and now that phase for separate attention. For example, in coming out of the depot you may look the people over and pick out a policeman to question, or you may look for a street car, or you may watch where the crowd goes and decide to follow it. As you have more and more experiences with strange depots the mental confusion disappears; you have learned how to behave in such situations; you have them clearly analyzed into checking rooms, ticket offices, train bulletin boards, train announcers, cab drivers, policemen, street-car conductors, street signs, etc., and have developed appropriate methods of noticing these and behaving accordingly.

Unnecessary to dig out smallest elements in many situations. — We usually carry our analysis only as far as is necessary for practical purposes. Hence we are quite familiar with many complex situations or objects, and know just how to behave toward them, although we have never analyzed them into their smallest elements. For example, we learn to recognize and to eat or avoid onions; we are familiar with their so-called "taste" and know how to behave toward

it. As a matter of fact, most of the so-called taste is a complex mixture of taste and odor. It can be analyzed into these two elements by having a person close his eyes, plug his nostrils, stick out his tongue, and close his lips. Then place a piece of onion or potato or apple or turnip on his tongue and have him guess which it is. Obviously, however, this process is unnecessary in teaching a person to recognize and discriminate onions from potatoes, apples, and turnips in daily life.

Similarly, children learn to recognize, name, and use such complex objects as doors, windows, chairs, wagons, automobiles, etc. without first being taught that these have acute and obtuse angles or consist of circles, rectangles, squares, cylinders, or what not. It is obvious that an A B C of observation organized in geometrical terms is an unnecessary and useless device in teaching observation in ordinary life, since for most practical purposes the analysis of complex objects and situations is not carried down to such geometrical elements.

Subject matter, now psychologically organized, begins with wholes. — Thus we see that great modern psychologists, such as William James, describe learning *not* in terms of proceeding from the simple to the complex, *but* in terms of the learner's meeting more or less complex objects or situations and analyzing these as far as may be necessary for practical behavior. This account of the learning process is having large influence in changing the organization of subject matter. For example, since children can easily recognize as wholes such *statements* as "We have two pets" or "They are white mice," such short sentences may be used in beginning reading, instead of beginning with letters or syllables.

This process is described in one of the current manuals of a commercialized reading system in the following terms, which clearly reflect James's influence:

Wholes to Parts, to Wholes. — The vague whole [namely, the story of Little Bo Peep or of Jack Horner] is acquired by the children through listening to the story told by the teacher, and through the exercise of their own self-activity in dramatization. The story is first analyzed into thought groups. The thought groups are then built up synthetically by the teacher, sentence by sentence, at the blackboard. Word groups and sight words are taken from the sentences. Selected words are separated into phonograms. Phonograms are blended to form words. The final step is the reading of the whole story from the book.

Similarly, in handwriting, the children write whole *words or phrases* before they are drilled in making meaningless straight lines and curved lines. Perhaps the most striking change is in drawing, in which the child in the primary grades may draw such *pictures* as those shown on page 152 and may never draw mere curved lines and straight lines as such. Equally striking are the changes in gymnastics and in kindergarten activities. In place of simple-to-complex calisthenics, children play *games*, which, as large unanalyzed wholes, give them excellent exercise and at the same time give training in recreation and certain social virtues. As to the kindergarten, the geometrical playthings and forms of beauty are being forgotten, and such large *projects* used as were described above, on page 126; namely, playhouses, grocery stores, dry-goods stores, and other community buildings.

Courage to permit crudeness of childhood replaces perfect models. — In all of the processes involving handwork by little children, such as handwriting, drawing, and construction, progressive teachers are willing to accept rather crude products. This contrasts strongly with the desire for perfectly clean, clear-cut, copper-plate, model products for exhibition purposes which commonly prevails where alphabet methods are followed. It is recognized that if the pupils are to do their own analyzing, selecting, rejecting, and expressing, their products at first will be quite rough and

DRAWING AS STORY-TELLING

Illustrations by second grade children of an original Arab story composed by them. Evidently something is happening in this picture. What do you suppose it is? See page 151. From Sargent's "How Children Learn to Draw." (Ginn and Company)

incomplete as compared with the finished product of the adult expert. But in their willingness to accept such crude products of little children, teachers are carrying out Rousseau's program for psychologizing teaching by studying childhood. Instead of merely "being attached to what is important for men to know," teachers now "consider what children are able to apprehend"; instead of "always looking for the man in the child," teachers now are "thinking about what he was before he became a man," and organizing their subject matter in terms of his capacities and interests as a child.

Summary concerning psychological organization. — Thus we see that the psychological method of organizing subject matter is a large factor in improving teaching to-day. In introducing the discussion of the psychological organization we used the subject of history in order to contrast the older method of organizing subject matter merely in terms of the subject, which in the case of history produces the chronological order. We then presented Rousseau's epoch-making appeal to organize subject matter in terms of childhood, and told how far astray Pestalozzi and Froebel went in their efforts to carry out Rousseau's ideas. We pointed out that in organizing simple-to-complex alphabets in each subject they were not basing their organization on the capacities, interests, and learning processes of children but merely on an analysis of each subject. The mistakes of these well-intentioned educators were due to the fact that they were comparatively crude and amateur psychologists. When we turned to the discussions of learning presented by William James, the greatest American psychologist, we found him emphasizing the fact that analysis of complex wholes by the learner is a large factor in learning by children and adults. This fact parallels, in a way, the conclusion which we reached in the first half of this chapter, where the emphasis in organizing history, geography, and kindergarten activities was

placed on the organization around certain large topics or projects. The combination of the intensive method and the psychological methods of organization is resulting in the centering of instruction in units of subject matter that correspond to real situations in social life and at the same time are full of meaning to children and adapted to their capacities for learning and their interests at each age.

WASHING THE KINDERGARTEN DOLLS' CLOTHES

A meaningful social activity substituted for the conventional meaningless, simplex to complex, genetic, and logical exercises pictured on page 141. Notice the improvised tubs, toy ironing board, and toy iron. From a Chicago public school kindergarten.

Transition to Part II on learning processes; summary of Part I on fundamental points of view. — The statements made above concerning analysis by pupils when they are learning give only one inkling concerning the way children learn. The complete story of their methods of learning was roughly outlined in Rousseau's "Emile" in 1762, but has been greatly elaborated by later writers. This story is so long that we shall devote all of Part II of this book to relating it. Before doing this, it is desirable to get our bearings by reviewing briefly Part I, which has presented certain fundamental points of view that will guide us in our later thinking.

These fundamental points of view may be summarized as follows:

1. In our interdependent democratic American society the aim of public education is to increase the sum total of happiness for the multitudes.

2. To this end, the schools train for health, enjoyment of leisure, good will, and social service by developing in children appropriate information, habits, ideals, and abiding, many-sided interests.

3. The effective organization of such training involves reproducing in schools a prominent feature of our complex social life; namely, effective business management for economy in routine affairs.

4. The selection of the subject matter that is to be used to attain the broad social aims of the school should be made from the social viewpoint. The material should be clearly adapted to real present-day needs and conditions, and the relative values of the topics should be scientifically determined.

5. Such scientific determination requires investigations that are mathematically precise, objective, verifiable, expert, and impartial.

6. Where such scientific investigations have not been made we must rely on the opinions of great specialists, thinkers and writers such as Spencer and Dewey, who have devoted much thought to education. These opinions are not always valid.

7. Progressive textbooks and teachers organize the selected subject matter around large significant central topics, and begin with units that are meaningful to pupils and adapted to their capacities, interests, and processes of learning at each age.

8. The study of these learning processes of pupils is such a complex and important undertaking that Part II of the text will be devoted to it.

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PART II. LEARNING PROCESSES; GENERAL ASPECTS

CHAPTER VI

HOW CHILDREN LEARN; BY THEIR OWN RESPONSES

The Doctrine of Self-Activity

Main points of the chapter. — 1. This chapter continues the story of how children learn, which was begun at the end of the preceding chapter.

2. The term "learning" is used here in the broadest sense, to denote any change brought about in a pupil's methods of thinking, feeling, and behaving.

3. This chapter emphasizes the fact that the child learns through *his own* mental responses, reactions, or behavior. This is the doctrine of self-activity.

4. The teacher serves merely to stimulate the pupil's activity; hence we may distinguish teacher activity and pupil activity.

5. Pupil self-activity is often more influenced by other pupils than by the teacher.

6. Slow, dull teachers and rapid-fire nervous teachers are opposite extremes in the types of pupil self-activity which they arouse.

7. In complicated kinds of learning, a pupil's self-activity demands time and opportunity for mental experimentation and self-correction.

8. In such cases the artistic teacher shows great skill in inferring the internal mental responses of the pupil and giving the proper cues to modify them.

Relation to Part I. — In Part I of the book we developed certain fundamental points of view concerning the aims, management, and subject matter of elementary schools. These were summarized on page 155 as a transition to Part II. The last points in the summary emphasized the fact that the organization of subject matter is now being determined by the interests, capacities, and learning processes of the pupils. This is known as the psychological method of organization. Following the program proposed by Rousseau, it centers its attention upon the study of childhood; it studies the processes by which children learn most economically and effectively in order to determine how they should be taught. Since this psychological program is quite long, we shall devote a number of chapters, constituting Part II of this book, to a study of children's learning processes *in general*. This will leave for future discussion certain *special types* of learning, such as those involved in training children to read, to write, to spell, to solve problems, to understand and use general ideas, to express themselves in speaking, writing, and drawing, to enjoy music, games, and reading, to be interested in helping others, etc.

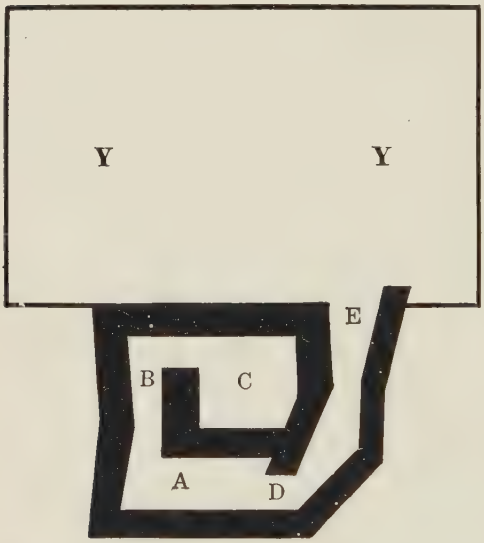
Term "learning" has broad meaning; learning to think, to feel, to behave, etc. — These various types of learning suggest that the term "learning" is being used here in a very broad way. Very often it has been used in school in a very narrow sense, suggesting merely memorizing of facts. Even the everyday use of the term, however, contains much broader suggestions than this, since we speak of children learning to swim, to play the piano, to swear, to steal, to be obedient, to be disrespectful, to dislike poetry, to enjoy poetry, to exercise self-control, to use good judgment, etc. Moreover, in recent years psychologists have centered their attention and writing more and more upon *many* kinds of learning processes, and we find them studying how a monkey learns to open the door of a cage, whether he imitates other

monkeys or not, how white mice learn to run blindfolded through complicated mazes, how human beings learn to open puzzle boxes, to solve puzzle problems, to memorize poetry, to draw simple figures, etc. Hence, the term "learning" no longer suggests mere memorizing of facts, but suggests any change that takes place in a pupil's methods of thinking or feeling or doing. For example, in thinking, he learns to analyze carefully a problem in arithmetic before beginning to "cipher"; in feeling, he learns to enjoy complicated harmonies or to dislike lying and swearing; in doing, he learns to pile blocks, to fold paper, to keep his desk in order, to write legibly, to find books in a library, to collect pictures and articles from magazines, etc.

Precise, objective investigations of learning. — In some of the psychological investigations of learning, scientific methods have been used which have the characteristics noted above on page 110; that is, they are mathematically precise, objective, etc. A simple example of experimentation which shows clearly its objective and precise character is found in the following description by Thorndike of the way little chickens learn to find their way out of a lonesome maze into the pleasant company of other chickens in the yard.

Let a number of chicks, say six to twelve days old, be kept in a yard (YY of figure on page 160) adjoining which is a pen or maze (ABCDE). A chick is taken from the group and put in alone at A. It is confronted by a situation which is, in essence, *confining walls and the absence of other chicks, food, and familiar surroundings.* It reacts to the situation by running around, making loud sounds, and jumping at the walls. When it jumps at the walls it has the discomforts of thwarted effort, and when it runs to B or C or D, it has a continuation of the situation just described; [but] when it runs to E, it gets out and has the satisfaction of being with the other chicks, of eating, and of being in its usual habitat. If it is repeatedly put in again at A, one finds that it jumps and runs to B or C less and less often, until finally its only act is to run to

D, E, and out. It has formed an association, or connection, or bond between the situation due to its removal to A and the response of going to E. In common language, it has learned to go to E when put at A, — has learned the way out. The decrease in useless running and jumping and standing still finds a representative in the decreasing amount of time taken by the chick to escape. The two chicks that formed this particular association, for example, averaged *three and a half minutes* (one about three and the other about four) for their first five trials, but came finally to escape invariably within *five or six seconds.* (**3**: 125)



MAZE USED IN STUDYING LEARNING PROCESSES OF CHICKS

Each is put in alone at A and tries to find its way to Y, the yard. (After Thorndike)

In later chapters on the learning processes of pupils, we shall refer occasionally to such precise objective investigations. Unfortunately, in the facts about learning to be discussed in this chapter, such precise experimental evidence is lacking and we shall have to base our account largely on opinion and common observation. The first fact which we shall note is very simple, yet it is so commonly disregarded, and is so important in determining the teacher's attitude, that we shall devote to it all of this first brief chapter on how children learn.

Pupil learns through his own responses, reactions, attitudes, behavior. — The first fact referred to is that a pupil learns through his own responses, reactions, or behavior. Thus he learns to swim through trying to swim; he learns to like simple rhythmic poetry through the rhythmic feelings which it sets up in him and the rhythmic enunciation it induces in him; he learns to exercise self-control through "holding himself in," time and again; he learns to exercise careful judgment by time and again taking the attitude of "Let me see." It is obvious in all these cases that he could not learn through having somebody else do the thing for him; through having someone else swim, or get the rhythmic feelings, or "hold himself in," or take the attitude of "Let me see." Only by making these responses himself can the pupil acquire skill in swimming, rhythmic enjoyment of poetry, and habits of exercising self-control and careful judgment.

Self-activity of the pupil, not the teacher's activity, educates him. — This general fact that the pupil is educated through his own responses, or reactions, or behavior is sometimes called the doctrine of self-activity. The term "self" suggests the contrast with the *teacher's* activity, and brings out the fact that it is what the pupil does that educates him, not merely what the teacher does. The teacher's actions are effective only to the extent that they get each pupil to make the desired response. For example, the swimming teacher may go through the motions, but the pupil makes no progress in learning unless he endeavors to imitate the motions; the literature teacher may emphasize the rhythms while reading aloud, but if the pupil lacks a sense of rhythm, as some pupils do, he may make no rhythmic responses, get no rhythmic feelings or enjoyment, and, as a consequence, he may be quite puzzled at the teacher's enthusiastic liking for the poem and ecstatic remarks concerning it.

Pupil inattentive to teacher is often learning through surreptitious self-activity. — Regarded from the standpoint of the pupil's self-activity, the teacher is merely one part of the situation which may influence the child and which includes also furniture, books, and other pupils. Often a child learns much more from other pupils than he does from the teacher, because they call forth more responses from him. Thus a pupil may devote a large part of his activity during the day to learning from other pupils through writing notes, making spitballs, making a pin hum or sing, drawing pictures of the teacher, etc. while the latter is fruitlessly trying to secure his attention. Often if he is very bright and the teacher is quite slow, a pupil learns more through surreptitious reading of books or through general mind-wandering than he does through the responses which the teacher stimulates him to make. Thus a bright child may be examining a map in his geography and playing a game of locating places while the slow teacher is pursuing a stupid child or correcting misbehavior. Hence, bright children may learn in school in spite of a dull or slow teacher through their own devices in finding things to play with, to think about, or to read.

Slow children may be merely passive or scared observers of rapid-fire teacher. — At the opposite extreme from the slow teacher who fails to influence the self-active responses of the bright pupils we find the energetic, nervous, active, scintillating teacher who may proceed at such a fast pace that only the bright pupils can grasp what is going on. There is abundant teacher activity and satisfactory pupil activity in a few cases, but most of the pupils, while apparently attentive, are either completely swamped or mere passive observers. Their self-activity often consists merely in wondering what it is all about, or in idly watching the teacher's gyrations, or in thinking, "I hope she won't call on me."

Recitations judged by relative amount of teacher activity and pupil activity. — The contrast between the teacher's activity and the pupils' self-activity is often made the basis

of criticizing and evaluating recitations observed. Very commonly a teacher may know all about a subject and give much evidence of this fact by the large amount of talking which she does in a recitation, but the teaching be ranked as poor because the children are given so little opportunity to respond. Hence, prolonged lecturing to pupils is condemned as well as the use of many long questions by the teacher with brief or monosyllabic answers from pupils.

Another example of superfluous teacher activity which kills pupil self-activity is found in the impatience of teachers when children are trying to *think out the answer to a problem*. Self-activity in this case involves the children's thinking over their related knowledge and trying to recall ideas to be used in the solution. This *process takes time*. A skilled teacher may stand quietly before the class for fifteen seconds while the pupils think. This may occur many times during a half-hour lesson in history or geography in the middle grades. The nervous, unskilled teacher, however, fails to realize the mental activity that the pupils need to carry on; she is anxious to secure the objective results, to get the answer. Hence, she is continually pushing, nagging, suggesting, asking ten questions where one should suffice. Such a teacher usually creates a similar situation with her disciplinary measures, by constantly reproving, scolding, threatening. The discipline comes to depend upon her activity instead of depending upon the pupils' holding themselves in restraint, which is one of the highest forms of self-activity.

Self-control, self-restraint, and inhibition are high forms of self-activity. — The fact that self-control, self-restraint, or self-repression are important and valuable parts of a pupil's self-activity is emphasized by Thorndike in the following paragraph:

> Finally, activity may as well result in the inhibition as in the production of ideas and feelings and movements. A fifth-grade schoolroom in which children sit quietly reading or move about in a businesslike way may represent more real activity than a room

in which the children are waving their hands, incessantly making comments and asking questions. The first room *may*, it is true, represent mere repression and absence of interest and work; but it may represent interest, thought, and work *plus the inhibition of aimless expressions thereof*. It must not be forgotten that *not* to think the foolish irrelevant thought is [an] essential of reasoning; that *not* to follow the wrong impulse is the essential of character; that *not* to make the aimless and crude movement is the essential of skill. Success is in great measure not making failures. What a man does depends upon what impulses are neglected or overcome. We are what we are by reason of what we are not — what we do not permit ourselves to become. Activity is inhibitory as well as impulsive. (**2**: 40)

Mental experimentation, often with crude results, accompanies self-correction. — It is important to notice that such self-correction as Thorndike emphasizes is only possible, however, if the children are given some opportunities for mental experimentation, some chances to think the wrong thoughts and to correct themselves, some opportunities to make crude drawings and to improve them. We had in earlier chapters two good illustrations of neglect of this fact. The first occurred on page 70 in describing the work of kindergarten teachers who prepare the materials for pupils so completely that there is little left for the children to do, and, as a consequence, the latter fail to develop independent ability in handwork. The other example of failure to give children opportunities for mental experimentation was noted in the efforts of Pestalozzi to organize simple-to-complex alphabets which were to be fed to children in spoonfuls, as it were, so that they could progress, step by step, without any chance of making a mistake. The facts concerning self-activity, however, make it clear that you can't feed a pupil ready-made education by carefully graduated spoonfuls, but that his learning depends upon his own efforts in thinking, feeling, talking, writing, drawing,

and making; that these efforts may be quite crude at first; that they improve through his own efforts at self-control; and that mental experimentation by the pupil is often necessary to eliminate crude and incorrect ideas or performances.

Self-correction relatively easy to suggest where product is objective. — The doctrine of self-activity thus tends to focus the attention of the teacher on the reactions and responses of the pupils as individuals. Where the end to be attained is represented by some *objective* product, such as a pile of blocks or a doll's dress in the kindergarten, or a drawing of a farmhouse in the first grade, or correct notes in singing, or letters in handwriting in later grades, it is a comparatively simple matter to decide whether each pupil has made the desired response and to proceed accordingly. For example, in handwriting, if the pupil grips his pen too tightly, the teacher can observe this fact and have the pupil correct it; in singing, if the pupil tends to be a monotone, he may be placed close to the piano or to the teacher. Even in such cases, however, it is sometimes difficult to give the right cue or suggestion which will enable the pupil to make the correct response. For example, mispronunciations are easily observed and commented upon, but a Western teacher had great difficulty in getting a pupil from New York City to cease saying "feller" and "idear." The pupil could not see the difference between his pronunciation of "idea" and the teacher's; he insisted, "I don't say 'idear,' I say 'idear' just like you do."

Inner responses, thoughts, and feelings of pupils difficult to determine. — When we come to consider the *inner* mental responses of pupils, it often requires great skill to determine if each pupil has made the correct response. Very often we have to depend on what the child says, but his words may belie his thoughts. For example, a first-grade class in a wealthy community read very glibly, "The three little pigs went out to make their living," but not a child in

the class knew what it meant "to make a living," and the teacher discovered the fact by an accidental question. In the case of the response of enjoying a poem, we have even greater difficulty in getting the "inside facts" of the pupil's mental reactions; he may be merely memorizing it, or thinking "I wonder when the bell will ring," or, worse, feeling more or less disgusted with the whole matter. In the case of effective problem solving, we are often at a loss to know whether a pupil is really actively searching in his mind for suggestions and carefully weighing each, or whether he is merely voicing the first idea that pops into his head, or lazily sitting back and thinking "I wonder who will answer this one."

Artistic teacher understands pupil's mental responses and means of changing them. — A skilled teacher must, therefore, be an artist in understanding children's ways of thinking, feeling, and expressing. She must be able to infer skillfully from a pupil's words and outer attitude what are the inside facts. Having inferred his mental condition, she must know just what cue to give, what question to ask, what information to add, what praise or criticism to bestow, in order to start the pupil's mental responses in the desired direction. In order to do this, she must understand the conditions which determine a pupil's response to any situation. These conditions will be taken up in separate chapters. The first condition, namely, the influence of the pupil's previous experience, will be taken up in the next chapter. For a summary of the present chapter, the first on children's learning processes, the reader may return to page 157.

BIBLIOGRAPHICAL NOTES

The references marked with an asterisk are especially recommended to beginners.

* 1. FREEMAN, F. N. *How Children Learn.* (Houghton Mifflin Company, 1917.) Read the entire volume for an excellent elementary account of all topics in Part II of this text.

* 2. THORNDIKE, E. L. *The Principles of Teaching.* (A. G. Seiler, 1906.) Pp. 39–41. The discussion printed above is largely a paraphrase of these excellent pages in Thorndike's text.

3. THORNDIKE, E. L. *Educational Psychology, Briefer Course.* (Teachers College, Columbia University, 1915.) Part II, on the psychology of learning. Technical discussions for advanced students.

CHAPTER VII

BUILDING ON PUPILS' PAST EXPERIENCES

The Doctrine of Apperception

Main points of the chapter. — 1. Varied interpretations of words illustrate the influence of past experiences in determining pupils' responses.

2. Children's correct statements often disguise their real ignorance.

3. Scientific investigations of the contents of children's minds upon entering school reveal their vast ignorance of common objects.

4. Rousseau proposed to correct the parrotlike recitations of meaningless words by introducing *object teaching*, nature study, measuring, etc.

5. Efforts to carry out these reforms, however, soon degenerated into memorizing books about objects.

6. Even the kindergarten ascribed to children ability to understand abstract ideas that never entered the heads of most of them.

7. Properly taught home geography, which uses local situations, illustrates giving children adequate real experiences. Modeling in sand and clay is widely used to make surface features vivid.

8. Teachers need thorough specialized training to teach realities instead of meaningless words.

To determine how past experiences influence present responses. — The preceding chapter described the way pupils learn through their own mental responses and reactions. It closed with the fact that artistic teachers must be quite skilled in guessing just what are the inner mental responses of each pupil, and in understanding the conditions which determine and influence these responses. The first of these determining conditions will be discussed in this chapter; namely, the influence of the pupil's past experience.

Examples of mental responses to "bay," "Belgium," "abolition." — If we examine a simple illustration from ordinary life we can easily see how a person's past experience influences his response to some present situation. For example, notice what idea or mental response is aroused in your own mind when you now read the word "bay." Then imagine the different mental interpretations that would probably be aroused by the same word in the minds of each of the following persons: a horse dealer, a carpenter, a boy studying geography, a domestic-science student. In your own case and in each of the others it is easy to explain the particular response made by referring to past experiences. Differences in *emotional* responses to the same word or situation are also partially explained by differences in past experiences; for example, the word "Belgium" now arouses in Americans an entirely different type of feeling from that aroused before the experiences of the Great War. Similarly, during our Civil War the emotional responses aroused in Northerners were quite different from those aroused in Southerners by the words "Lincoln," "Jefferson Davis," "abolition," "states' rights."

Teacher builds on pupils' old experiences and provides necessary new ones. — When we turn to the mental responses of children in school, we see the pedagogical significance of such examples. Since the same words may arouse different ideas and feelings in the minds of different persons, depending upon their past experiences, it is very important that a teacher make sure that each pupil does interpret the words used in the ways that she desires. In order to do this, she must understand clearly his past experiences and build her instruction upon these. If he has had the necessary experience she must connect the new teaching with it; if he lacks the necessary real experiences to arouse the proper ideas or feelings, these real experiences must be provided. *This is known as the principle of apperception.*

Words used as meaningless jingle. *Counting.* — One of the most common violations of the principle of apperception in teaching is found in the tendency to assume that children can count because they can say "one, two, three, four," etc.

GIVING CITY KINDERGARTEN CHILDREN REAL EXPERIENCES WITH CHICKENS

Story of the above picture. — The story of this picture is well represented in the following sentences composed by the kindergarten children of The University of Chicago Elementary School and written down by their teacher.

OUR MOTHER HEN AND HER CHICKS

We went to the grocery store and bought a barrel and carried it home. Then we made a nest of straw. The next day Miss Gordon brought us a mother hen and thirteen eggs.

We named her "Brownie Red Head." She is a big hen with feathers on her legs.

We put the eggs in the nest and put the hen on them. We set her April 7, 1916. She sat three weeks. We fed her corn and gave her water.

Five chickens hatched on the 27th and the next day the rest hatched.

The little chickens were all yellow. Some had black spots on them.

We have to feed them every day.

A group of such children, five-year-olds, who had remarked proudly that they could count, were asked to count an adult's fingers as she held up one hand and pointed in turn at the five fingers with the other. The children recited their rigmarole of "one, two, three," etc. clear up through twelve before the lady had finished pointing at the fourth finger. Other trials made with these children showed they had no number ideas at all connected with most of these number names. The latter were for the children merely a meaningless jingle like "eenie, meenie, minie, mo." They had never had real experiences in counting objects, but had merely learned the jingle of number names through hearing other children or adults say them.

Lack of real experiences illustrated by slum children's ideas. — The contrast between the real experiences of country children and city children furnishes many illustrations of the dependence of a pupil's responses upon his previous experiences and the necessity of the teacher's taking careful account of the lack of adequate previous experience. This lack of experience is often made the subject of humorous incidents from school life. One of these from the experiences of the fictitious Miss Bailey with a slum class of Jewish children in New York is described by Myra Kelly in her fascinating story of school life entitled "Little Citizens." Miss Bailey, the teacher, had tried unsuccessfully to move her first-grade pupils with poems about nature, but they merely listened "in courteous but puzzled silence." Finally, after reading a poem about a lark and making vain efforts to get from the children some real ideas of this bird the story proceeds as follows:

"Well," Morris began with renewed confidence, "I know what is a bird. My auntie she had one from long. She says like that, she should give it to me, but my mamma she says, 'No, birds is foolishness.' But I know what is a bird. He scups on a stick in a cage."

"So he does," agreed Miss Bailey, rightly inferring from Morris's expressive pantomime that to "scup" was to swing. "But sometimes he flies up into the sky in the country, as I was reading to you. Were you ever in the country?"

"What country?" asked Morris. "Russia? I comes out of Russia."

"No, not Russia. Not any particular country. Just the open country where the flowers grow."

"No ma'an, I ain't seen it," said the child gently. "But I was once to Tompkins Square. On'y it was winter und snow lays on it. I ain't seen no flowers."

"And do none of you know anything about the country?" asked Teacher sadly.

"Oh, yiss ma'an, I know," said Eva Gonorowsky. "The country is the Fresh Air Fund."

"Then you 've been there," cried Miss Bailey. "Tell us about it, Eva."

"No ma'an, I ain't seen it," said Eva proudly. "I'm healthy. But a girl on my block she had a sickness und so she goes. She tells me all times how is the country. It 's got grass stickin' right up out of it. Grass und flowers! No ma'an, I ain't never seen it: I don't know where is it even, but oh! it could to be awful pretty!"

"Yes, honey, it is," said Teacher. "Very, very pretty. When I was a little girl I lived in the country."

"All day?" asked Morris.

"Yes, all day."

"Und all night?"

"Yes, dear."

"Oh, poor Miss Bailey," crooned Eva. "It could to be a awful sickness what you had."

"No, I was very well. I lived in the country because my father had a house there, and I played all day in the garden."

"Were n't you scared of the lions?" asked Patrick in incredulous admiration.

"We had no lions," Miss Bailey explained apologetically. "But we had rabbits and guinea pigs and a horse and a cow and chickens and ducks and — and — "

"Und eleflints," Morris suggested hopefully.

"No, we had no elephants," Teacher was forced to admit. "But we had a turtle and a monkey."

"Did your papa have a organ?" asked Sadie Gonorowsky. "Organs mit monkeys is stylish for mans."

"Think shame how you says!" cried her cousin Eva reproachfully. "Teacher ain't no Ginney. Organs ain't for Sheenies. They ain't for Krishts even. They all, all for Ginneys."

"So 's monkeys," said Sadie, unabashed. "Und organs mit monkeys *is* stylish."

The children's deep interest in the animal kingdom gave Miss Bailey the point of departure for which she had been seeking. She abandoned Wordsworth and Shelley, and she bought a rabbit and a pair of white mice. The First-Reader class was enchanted. A canary in a gilded cage soon hung before the window and "scupped" most energetically while goldfish in their bowl swam lazily back and forth. From these living texts Miss Bailey easily preached care and kindness towards all creatures, and Room 18 came to be an energetic, though independent, branch of the S. P. C. A. (**9**: 324–331. Copyright by Doubleday, Page & Co.)

The content of primary children's minds; ignorance of common objects. — Such examples of pupils' lack of real knowledge of common objects early led to careful investigations of the ignorance of primary children. One such study is entitled "The Contents of Children's Minds on Entering School," and was made by G. S. Hall, in Boston, in 1880. He had a number of trained kindergarten teachers take first-grade children individually and question them tactfully and skillfully to find out what were their ideas of certain common objects. One child, for example, said, "A cow is as big as your finger nail." Other examples from the investigation which illustrate the percentage of ignorance found in the children are presented in the table printed below. The items in the table should be read as follows:

Of ordinary Boston children entering the first grade,
80 per cent do not know what a beehive is;
77 per cent do not know what a crow is.

TABLE SHOWING PERCENTAGE OF BOSTON FIRST-GRADE CHILDREN WHO ARE IGNORANT OF EACH ITEM AS NOTED

	PER CENT		PER CENT
Beehive	80	What season it is	75.5
Crow	77	Location of ribs	90
Sparrow	57	Location of elbows	25
Hen	19	Spade	62
Oak tree	87	Blue	14
Maple tree	83	Red	9
Growing dandelion	52	Triangle	92
Dew	78	Circle	35

Teachers often ignorant of reality; practice teacher and pine trees. — The principle of apperception would require a teacher to canvass carefully the stock of ideas possessed by her pupils to determine such facts as were ascertained by Miss Bailey and Mr. Hall. Very often, however, teachers are not only content to teach mere words but are ignorant themselves of the real objects or ideas which the words represent. A striking example of the complacent acceptance by an adult of words without adequate meanings is found in the plans of a practice teacher who was preparing to teach fourth-grade children about pine trees. She read up on the subject, worked on her plans for several days, and brought them to the supervisor for approval. The latter asked her if she had ever seen a pine tree. The practice teacher replied, "Not to my knowledge," in spite of the fact that there were numerous pine trees in the vicinity. The supervisor sent the practice teacher to find and examine these, and directed her to include an excursion to the trees by the children as one of the first parts of her plan.

Children also misunderstand words expressing abstractions. — If the ignorance of children and adults concerning common objects is impressive, even more so is their ignorance of words which express abstract ideas and relations between ideas. The failure to comprehend simple abstract

ideas was illustrated in the counting example given earlier in the chapter, in which children used number names merely as a jingle of sounds. The difficulties which children may have with such abstract ideas when encountered in their reading is illustrated in the following quotation:

> The child who read that "the Pilgrims sought an asylum in Holland" and recited, "The Pilgrims went to an asylum in Holland," needed to have this idea investigated, and, as it turned out, corrected as well. . . . The author who writes for fifth-grade pupils that "the Norwegians are famous for their tenacity of will" writes over the heads of his readers. Even so simple a statement as the one that "the mountains of Japan are too near the coast to admit of long rivers" causes misunderstandings, since with school children *admit* means *to allow to enter*. (**4**: 102)

History of recognition of apperception. *Rousseau's objection to mirror-like, parrot recitations.* — The most important modern recognition of the futility of mere word teaching without adequate basis in real experience is found in Rousseau's proposals (1762) for a more intimate study of child experience. He used an interesting figure of speech in comparing a mirror with a child's recitation of mere words. He said the child reflects back the words which he learns "and those who hear these words understand them, but the child does not." In place of mirror-like, parrot recitations, Rousseau proposed giving real ideas through object study, nature study, home geography, excursions, manual training, observation of industries, measurement, etc.

Well-intentioned Pestalozzians went astray; memorizing definitions; Dickens's satire. — As a result of Rousseau's appeal in his "Émile," Pestalozzi and his followers organized schemes of object teaching for the purpose of giving children real knowledge of the real things of nature and industry, from the most common to the most remote. Even this instruction, however, soon degenerated into learning from books mere descriptions of objects. In England the

recitations based on these books were amusingly satirized by Charles Dickens in the following contrast between the recitations by Sissy Jupe, who knew horses from real experience, and Red-eyed Bitzer, who knew the prescribed definition contained in the textbook of the Home and Colonial Infant School Society.

> Sissy Jupe, Girl No. 20, the daughter of a strolling circus actor, whose life, no small share of it, has been passed under the canvas; whose knowledge of horse . . . extends back as far as memory reaches; familiar with the form and food, the powers and habits and everything relating to the horse; . . . Sissy Jupe has been asked to define horse. . . . Bewildered [however] by the striking want of resemblance between the horse of her own conceptions and the prescribed formula that represents the animal in the books of the Home and Colonial Society, she dares not trust herself with the confusing description, and shrinks from it in silence and alarm.
>
> "Girl No. 20 unable to define a horse," said Mr. Gradgrind.
>
> Girl No. 20 is declared possessed of no facts in reference to one of the commonest of animals, and appeal is made to one Red-eyed Bitzer, who knows horse practically only as he has seen a picture of a horse or as he has, perhaps, sometimes safely weathered the perils of a crowded street-crossing.
>
> "Bitzer," said Thomas Gradgrind, "your definition of a horse!"
>
> "Quadruped. Graminivorous. Forty teeth, namely: twenty-four grinders, four eye teeth, and twelve incisive. Sheds coat in the Spring; in marshy countries sheds hoofs too. Hoofs hard, but requiring to be shod with iron. Age known by marks in mouth." Thus [and much more] Bitzer.
>
> "Now Girl No. 20," said Mr. Gradgrind, "you know what a horse is." (**8**: 363–364)

Present-day examples of memorizing geography "stories." — That such instruction has not entirely disappeared from our schools is easily ascertained by observing teachers who are having children memorize and recite "stories" of coal, iron, wheat, etc. found in their geographies. For example,

the following paragraph about "what the cow furnishes us" parallels closely Red-eyed Bitzer's recitation. It is quoted from a "home" geography.

> Do you know how cheese is made? The milk is first curdled by putting into it some liquid rennet. Rennet is the name given to a preparation made from the inner coating of the calf's stomach. The curd is separated from the watery part of the milk, which is called whey, and then pressed into solid cakes. The curd is then called cheese.

In commenting on this paragraph one writer says:

> To the few children who have seen cheese made in this way, or who have actually made it in this way, the foregoing paragraph is concrete, but to those who have not had this experience and to whom this experience is not supplied, this paragraph is about as meaningful as the rule for extracting cube root found in our older arithmetics. To take children under these conditions over page after page of such material is a waste of good time. (**3**: 534)

Kindergartens ascribed to children impossible abstract ideas. — As we noted in an earlier chapter, another direct outcome of Rousseau's demands to base teaching on a study of childhood was the organization of the kindergarten. As we have stated several times, the fundamental kindergarten idea was to give children experiences with community activities and natural objects through play. Even here, however, in the very center of the movement to base education on children's instincts and capacities, we find the most curious failure to appreciate the limitations of children's understandings. Froebel, the founder of the kindergarten, was a person of peculiarly mystical temperament. This temperament, coupled with the extreme religious atmosphere of his father's house, led him to write such foolish statements as those printed below concerning children's mental responses in playing in the kindergarten with the cube and ball and in such games as "Ring around a Rosy" and

Courtesy of Teachers College, Columbia University

REALITIES REPLACE SYMBOLISM IN MODERN KINDERGARTEN

As early as 1781 Pestalozzi suggested teaching little children in school to lace their shoes

Courtesy of Teachers College, Columbia University

TOY COWS USED IN MODERN KINDERGARTEN

A rich topic for training in expression, construction, problem solving, and knowledge of animal needs and uses

"The Farmer 's in the Dell." In reading these statements do not struggle to understand them, because they are incomprehensible to most persons.

The child . . . [says Froebel] perceives in the ball the general expression of each object as well as of itself [the child] as a self-dependent whole and unity . . . so the child likes to employ himself with the ball, even early in life, in order to cultivate and fashion himself, though unconsciously, through and by it, as that which is his opposite and yet resembles him.

The cube is to the child the representative of each continually developing manifold body. The child has an intimation in it of the unity which lies at the foundation of all manifoldness and from which the latter proceeds.

The pleasure with which the children play these games and others of a similar kind may therefore have its ground in a presentiment of what is symbolic and significant in them. May not their delight in these encircling movements, for example, spring from the longing and the effort to get an all-round or all-sided grasp of an object? . . . I am convinced that the exalted and often ecstatic delight of children in their simple movement plays is by no means to be explained through the exertion of mere physical force — mere bodily activity. The true source of their joy is the dim premonition which stirs their sensitive hearts that in their play there is hidden a deep significance; that it is, in fact, the husk within which is concealed the kernel of a living spiritual truth. (8: 440)

Froebel's absurdities satirized by Thorndike. — The absurdity of Froebel's misunderstanding of the responses of ordinary children to common playthings led Thorndike to write the following satire:

And what shall I say of those who by a most extraordinary intellectual perversity attribute to children the habit of using common things as symbols of abstractions which have never in any way entered their heads; who tell us that the girl likes to play with her doll because the play symbolizes to her motherhood; that the boy likes to be out of doors because the sunlight symbolizes to him cheerfulness? . . .

Courtesy of Teachers College, Columbia University

KINDERGARTEN CHILDREN GARDENING

This activity needs no symbolic justification as a kindergarten topic

Courtesy of Teachers College, Columbia University

KINDERGARTEN CHILDREN RAKING LEAVES

Do these children "like to be outdoors because the sunlight symbolizes to them cheerfulness"? See bottom of page 179

If we live in houses because they symbolize protection, if we like to see Sherlock Holmes on the stage because he symbolizes to us craft, or Uncle Tom because he symbolizes to us slavery, or a clown from the circus because he symbolizes to us folly; if we eat apples because they symbolize to us the fall of man, or strawberries because they symbolize to us the scarlet woman, then perhaps the children play with the ball because it symbolizes "infinite development and absolute limitation."

No one has ever given a particle of valid evidence to show any such preposterous associations in children's minds between plain things and these far-away abstractions. (**2**: 77–80)

As a result of such criticisms, progressive kindergartners tend to emphasize such activities with playhouses, grocery stores, etc. as were described above on pages 126–127, expecting that children will acquire only the useful everyday knowledge and habits connected with these.

Summary of apperception; meaning, recognition, violation. — In our discussion of apperception up to this point, we have noted (1) how adult responses are influenced by their past experiences as illustrated by varied responses to the word "bay," (2) how city children lack adequate real experiences to understand statements about many common objects, (3) how teachers tend to accept mere words from a child as signs of ideas which he often lacks, (4) how Rousseau proposed to give children real ideas through adequate experiences with nature, industries, etc., (5) how these proposals resulted in mere word knowledge of objects through many Pestalozzian object-teaching books, and (6) how the founder of the kindergarten, although inspired by the Rousseau movement, attributed to children ability to understand abstract ideas that never enter the heads of most of them.

Review of examples of proper provisions for apperception. — Much of this discussion has necessitated descriptions of *mistaken* practices. These have been presented, however, in order to impress beginning teachers with the importance

of building their instruction upon children's real experiences and providing adequate new real experiences where these have been lacking. Incidentally in the chapter *correct* practices were suggested; for example, Miss Bailey introduced a canary, a rabbit, white mice, and goldfish into her first-grade room for slum children; the practice teacher was told to arrange an excursion to neighboring pine trees. Other examples of correct provision for real experiences and real ideas were given in earlier chapters; for example, in the description of the teaching of North America on pages 117–121, and the description of the psychological organization of history teaching on pages 135–140. In order to reënforce these positive suggestions for observing the principle of apperception, we shall describe one further example; namely, the teaching of home geography.

Home geography makes geographic ideas real; from near to remote. — The old-fashioned teaching of geography began with books and required memorizing of encyclopedic unrelated facts which were commonly uncomprehended. Maps were little used except for locations of boundaries, capes, bays, cities, etc. Little training was given even in the use of these maps, while surface maps, globes, and sand reliefs were entirely absent. All these practices should be corrected by beginning with real home geography and proceeding to more remote places and ideas, as described below.

Ideas of people. — In the modern teaching of geography the studies of the local community begun in the kindergarten give notions of people and their occupations. The history stories and activities in the primary grades give the children ideas of life in deserts, on the sea, in mountains, in Greece, Rome, etc.

Mapping neighborhood. — Systematic geography teaching may begin about the third grade by having the children make a map of the school yard and vicinity, locating on it houses, sidewalks, trees, etc., and labeling each of these appropriately. Gradually the map is extended to include

the neighborhood, and, if conditions permit, the children may map roughly all of the region in sight from some elevation, such as a neighboring hill. These elementary facts about place and direction are reënforced by studies in local history, commonly in the fourth grade. These studies extend the child's idea of his neighborhood to include the first place of settlement, the location of the first trading posts or farms, the growth of the population, the building of roads, canals, railroads, etc.

Globe as home of historic peoples. — By the middle of the fourth grade, children who have had the work described above have sufficient notions of directions and locations, and of different peoples, to begin the location of these upon the earth. A globe some twenty inches in diameter is suspended in the room and children are provided with six-inch globes, which cost only twenty-five cents and are used at their seats. Upon these they may locate their home and the homes of the Vikings, Greeks, and Romans, whom they have studied. Proceeding always in this concrete way, from the lives and customs of peoples to a study of their location upon the earth, the work in geography reaches the study of North America, which was described in detail on page 117. In this account the extensive use of pictures was noted, to give reality to the pupils' ideas of remote industries, mountains, cañons, etc.

Modeling clarifies geographic ideas; Pestalozzian example. — Finally, we may note one of the most striking devices which is used to give reality to geographic ideas; namely, modeling in sand or clay. One of the first examples of the use of this device occurs in the work of Pestalozzi about 1805 in Switzerland. Some of his lessons were described by a pupil as follows:

> The first elements of geography were taught us from the land itself. We were first taken to a narrow valley not far from Yverdon, where the river Buron runs. After taking a general

view of the valley, we were made to examine the details, until we had obtained an exact and complete idea of it. We were then told to take some of the clay which lay in beds on one side of the valley and fill the baskets which we had brought for the purpose. On our return to the [school], we took our places at the long tables and reproduced in relief the valley we had just studied, each one doing the part that had been allotted to him. In the course of the next few days, [occurred] more walks and more explorations, each day on higher ground, and each time with a further extension of our work. Only when our relief was finished were we shown the map, which by this means we did not see until we were in a position to understand it. (**8**: 327)

SAND-PAN AS AN IMPORTANT AID IN CLARIFYING AND VITALIZING GEOGRAPHY AND HISTORY

The seven hills of Rome made by fourth-grade children in The University of Chicago Elementary School. Note the two walls, the river Tiber, and Horatius at the bridge. See explanation, below

Story of the above picture. — This picture represents an excellent sand-table project worked out by fourth-grade pupils who were studying Roman history. The details of the picture, showing the seven hills of Rome, the two walls, the river Tiber, and the incident of Horatius at the bridge are worthy of careful study. For a complete description of the process by which the class carried on the work, see the article by the teacher, Miss Grace Storm, in the *Elementary School Journal*, November, 1915, Vol. XVI, pp. 132–146. For a similar project in geography,

namely, a relief and products map of the United States, see Miss Storm's article in the *Elementary School Journal*, September, 1914, Vol. XVI, pp. 29–40.

When engaged in the public schools of a small town in Illinois, Miss Storm secured the pans for similar projects through children who procured from home two shallow, galvanized-iron pans which had been used under automobiles in garages. Two cheap low tables were then procured, and the two pans, placed side by side, gave ample room for a map of the United States.

The picture illustrates the matter of schoolroom equipment and the use of constructive activities as well as the apperceptional teaching of geography as described on pages 183–187.

A SAXON SETTLEMENT AS A SAND-PAN CONSTRUCTION PROJECT IN FIFTH-GRADE HISTORY

From The University of Chicago Elementary School. Compare the articles by Miss Grace Storm referred to above

Inexpensive sand-pan makes surface features vivid. — In well-equipped schools of the present day large galvanized-iron sand-pans are extensively used for making relief models of places studied. Pictures of such models made by the children are shown above and on page 186. As a rule, children work in committees on assigned units, such as the Appalachian Mountains, the Great Lakes, the Mississippi River. The careful attention to the geographic realities which is required of children in such an exercise will readily appear to the reader if she will try to model the Great Lakes in some sand. One fourth-grade child who was doing this said,

Courtesy of The University of Chicago Elementary School

APPERCEPTIONAL TEACHING OF GEOGRAPHY ILLUSTRATED BY AN IRRIGATION PROJECT WORKED OUT IN SAND-PANS BY SIXTH-GRADE CHILDREN

See story on opposite page

"Gee, the Great Lakes are hard to put in; they are so *in*-regular." After the relief of the United States is completed in the sand-table, it forms a vivid link in helping the children to understand a surface map done in colors; they readily translate the dark browns of the map into the high mountains of the sand-table, and translate the latter into the pictures of mountains with which the study began. Such symbols — pictures, sand-pan relief, and colored surface maps — carry for them much more real ideas of surface formations than are conveyed by the mere words of the book concerning elevations, depressions, mountain systems, and river basins. A four-by-six-foot galvanized-iron pan and the sand and clay which make possible such vivid geographic teaching can easily be secured at small cost for any school. In one school, in which reliefs like those shown on pages 184–186 were worked out by the pupils, the latter brought two pans from private garages where they had been used under automobiles.

Story of the picture on opposite page. — This picture shows sixth-grade children engaged in solving an irrigation problem in sand-pans during the geography period. In the *large* pan you can see at the left a ditch which represents the river. To the right of the river is represented land which is considerably higher than the river. The problem was to irrigate this land from the river without using any mechanical device to pump or lift the water from the lower course of the stream. The children tried building dams at places in the upper course to back up and elevate the water. They then constructed across country, from above the dam, the main supply ditch, keeping it on high ground so that the lateral ditches supplying the farms descended toward the river. The picture illustrates the use of sand-pan modeling to clarify geographical ideas as described on page 185. It also illustrates training in problem solving and construction as well as the utilization of children's instinctive interests in manipulation, problem solving, and group emulation. The latter appears in the contest to see which of the several teams at work on the problem could first achieve a satisfactory solution.

Specialized teacher-training makes possible skilled apperceptional teaching. — The effective use of modeling as a geographic aid requires more knowledge and training on the part of the teacher than merely hearing recitations of memorized words. This is true of all skilled teaching which properly recognizes the principle of apperception by providing abundant real experiences for children and building instruction upon these. But, as indicated in the introductory chapter, many normal schools now provide specialized training for teaching in primary grades and middle grades, and such training, if properly conducted, is devoted largely to giving students a knowledge of the children, subject matter, and methods of the grades in which they expect to teach. With such full specialized training, teachers may be expected to know enough themselves about realities to make ideas real to children and to secure from the latter mental responses of understanding and evaluation instead of mere words.

Conclusion. — This will conclude our second chapter on the learning processes of pupils. In the first of these chapters we noted that the children learn through their self-activity, through their own mental responses. Hence it becomes important for the teacher to be skilled in inferring just what the inner responses of children are and in understanding the conditions which influence these responses. In the present chapter we traced the influence of past experiences on present responses. In the next chapter we shall trace the influence of the pupil's present frame of mind.

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CHAPTER VIII

PUTTING PUPILS IN A FAVORABLE FRAME OF MIND

The Doctrine of Preparation

Main points of the chapter. — 1. A pupil's response or reaction in any situation is largely influenced by his general frame of mind.

2. Striking examples occur in the very irrelevant answers which a pupil gives to questions even when he knows the correct answers.

3. Consequently the teacher should put the pupil in the proper frame of mind

a. by arousing the general line of thought which she desires him to pursue, and

b. by arousing favorable emotional attitudes, such as curiosity and interest.

Three principles of teaching: self-activity, apperception, preparation. — This chapter introduces the third general fact concerning the learning processes of children. The first fact, discussed in Chapter VI, is that children learn through their own responses, reactions, or behavior; hence teachers must be skilled in determining whether the educative responses which they desire have actually been made by the pupils. This we called the doctrine of self-activity. To secure in pupils specific mental responses, the teacher must understand the conditions which influence these responses. Our second general fact about learning appeared in this connection in Chapter VII, namely, that a pupil's response is influenced by his past experiences; hence the teacher must understand each pupil's past experiences and build upon these. This we called the doctrine of apperception. The third principle of learning will be discussed in this chapter,

namely, that a pupil's response is also influenced by his present frame of mind; hence the teacher should take steps to put him in a frame of mind conducive to the responses which she desires; she should prepare his mind, set his mental stage, as it were, for the mental action that is to follow. This we call the doctrine of preparation.

Examples of influence of mental backgrounds; the word "bay" again. — As an example of the influence of a person's general frame of mind in determining his mental response, we may use again the varied interpretations of the word "bay." In reading the sentence "Pupils in geography learn to define river, lake, gulf, bay, etc.," almost any person would think of the geographic meaning of "bay" instead of thinking of a bay horse or a bay window or the bay leaf used in seasoning. This similarity of response or interpretation is due to the fact that the earlier suggestions in the sentence have put the reader in the *geographic frame of mind*. The similarity in the responses may thus be contrasted with the variety of responses noted on page 169, where the same word "bay" was presented without preliminary preparation of a mental background.

Mistake in reading caused by wrong background. — Another example of the influence of a person's frame of mind in determining his response to a situation is found in the following incident from my own experience:

I was riding in a train and happened to look over the shoulder of the man in front of me at the newspaper he was reading. I could just see the top of the paper and read there the following large headline, extending clear across the page:

GOOD HATS A QUARTER

Inasmuch as I always take advantage of end-of-the-season reduction sales of men's furnishings, this statement interested me (although good hats for a quarter seemed impossible) and I decided to look into the matter further when I got a chance. Soon the

man left his seat to go into the smoking car. I picked up his paper and, turning to the desired page, found that instead of reading

GOOD HATS A QUARTER

the headline read

GOD HATES A QUITTER

It was Monday morning and the paper in question contained reports of Sunday sermons printed with large-type headlines running clear across the page. If I had been in the religious frame of mind at the time, instead of the bargain-hunting frame of mind, I might have read the headline correctly at the first glance.

Colorless sentence given varied meanings by different backgrounds. — Further examples of the great variety of mental responses which may be aroused by the same words being projected against different mental backgrounds are given by Adams in the following quotation:

> Take some such colorless sentence as "Think of him," and note the difference effected by projecting it against the following backgrounds:
>
> A picture in *Life* of a low-class photographer trying to encourage a pleasant expression on his female sitter's face. [Think of *him.*]
>
> A widow laying flowers on a grave and addressing her little girl. [Think of *him.*]
>
> A religious revival meeting. [Think of *Him.*]
>
> A French schoolmaster during the Franco-Prussian War pointing to a picture of the first Napoleon. [Think of *him.*]
>
> A conspirators' meeting where a traitor's name has been mentioned. [Oooo! think of *him*!] (**1**: 93)

Pupils' irrelevant answers illustrate influence of wrong line of thought. — In school we find many examples of the influence of mental backgrounds in producing varied responses by pupils. These examples often occur in the unexpected answers in response to a question that was intended to elicit an entirely different line of thought, as illustrated by Adams in the following quotation:

A question is asked, for example, the answer to which is known to be within the range of the pupil's knowledge. There is no doubt about the matter. . . . The question is, however, so expressed that the pupil, with the best intention in the world, cannot discover against which background he is expected to project the ideas concerned. Accordingly he projects them against the first available background, in the hope that this may be the right one.

"Where was St. Paul converted?" asks the teacher, speaking from a geographical background. "In the ninth chapter of the Acts," responds the pupil, from a background of textual reference. In testing the intelligence of a class the inspector asks, "Where do you find gates?" The pupil, from a background made up of puzzling experiences of the Socratic method, answers, "We don't find gates, we make them." From a historico-geographical background the inspector desired to elicit the deleterious effect of a large town on the purity of a river. He brought out the fact that Robert the Bruce [1274–1329] spent his latter years at Roseneath on the Clyde in Scotland, and that as a recreation he very probably — according to the inspector — fished in the river. The question that was to incriminate those who were responsible for the pollution of the Clyde took the form "Why could n't the Bruce fish there now?" From a background of plain common sense came the reply, "Because he's dead." (**1**: 96)

Absurd answers in written tests show predominance of wrong set of mind. — Perhaps the strangest examples of the predominant influence of some special frame of mind or mental background in determining the mental responses of a pupil are found in the wrong answers in written examinations. In such cases the teacher often marvels at the absurdly irrelevant responses that the pupils make. Striking illustrations of such absurd answers were secured by Thorndike (**5**: 98) when he gave a reading test to children in the upper grades. A portion of the test read as follows:

Read this and then write the answers to 1, 2, 3, 4, 5, 6, 7, and 8. Read it again as often as you need to.

Tom gave a gray cat to Mary. She gave him a black dog.
1. What did Tom give the girl?
2. What did the girl give Tom?
3. What was the girl's name?
(Five similar questions completed the eight.)

In writing his answers, one pupil was evidently *strongly influenced by a recent written lesson in substituting pronouns for nouns.* Hence, instead of *answering* the questions he merely *copied* them, but substituted pronouns, thus:

1. What did *he* give the girl?
2. What did the girl give?
3. What was *her* name?

The reader may be interested in *guessing what mental background was predominant* in the case of the pupil who, instead of answering the questions, merely copied them, but followed each with certain phrases as indicated below:

1. "What did Tom give the girl?" *said Mary.*
2. "What did the girl give Tom?" *asked her sister.*
3. "What was the girl's name?" *said her mother.*

Cross section of pupil's mental responses would reveal strange contrasts. — The strangely irrelevant responses which appear in pupils' written papers are instructive in suggesting that equally irrelevant and confused mental responses must be taking place during oral recitations. If a teacher could get a cross-section view of the mental responses being made by her pupils at any moment, it might surprise her with its weird and strange contrasts.

Teacher must put pupils in favorable frame of mind; must prepare mental backgrounds. — The educational inference which is drawn from the above facts is that a teacher should take special care to put the pupils in the proper frame of mind for the lines of thought which she desires them to pursue; she should set the mental stages for the mental

action that is to follow; she should arrange the mental backgrounds upon which her statements and questions will fall. Steps to do this may vary from a few simple remarks at the beginning of a lesson to very elaborate precautions consuming a whole lesson period in preparation for lessons that are to follow.

Examples of step of preparation.—The following examples are illustrations of such preparatory steps taken by teachers.

1. A second-grade class was reading "Cinderella." At the beginning of the period the teacher *reviewed* the story as far as they had read. She then said: "Let us each take some character and read its part. Where no character is required, I will read. *Let 's see if we can finish* the story to-day." At the end of the period the children begged to remain a few minutes after the recess bell rang, in order to finish the story.

2. A third-grade class in Chicago was studying the water supply of the city. They were ready to discuss the laying of a pipe line out into Lake Michigan. At the beginning of the period the teacher had the class *recall the earlier methods* used to secure water; namely, dipping water out of the lake, digging wells, using water wagons, etc.

3. In a fourth-grade class the topic for the period was the *Roman soldiers*. Before taking it up the children talked about the *American soldiers*, their needs, the fact that they were having measles, the Red Cross work which the children were doing, the gathering of magazines for the soldiers, etc.

4. A fifth-grade class was studying "Robin Hood." They were outlining the action of the story preparatory to dramatizing it. The teacher said: "To-day we want to continue the story from where we left off, picking out the important points to put in your notebooks. Let us first *review* the points which you already have in your books."

5. An upper-grade class was beginning the study of the surveying of the Northwest Territory. In this connection

they *recalled their previous study* of surveys in Kentucky, the work of Daniel Boone, the tomahawking of trees for landmarks with the resulting overlapping of claims which led to feuds, the more accurate methods of surveying into townships, sections, quarter-sections, etc. In spite of this careful preparation, however, an observer noticed one girl turn to a boy and ask in a whisper, "What is a survey?" The boy said he did n't know. The teacher, being unaware of their ignorance, did not ask for any explanation of the word.

6. Very elaborate examples of the preparatory step are found in certain primary reading lessons. For instance, in one system the first material read by the children in the first grade is the rime

Seesaw! Seesaw!
Here we go up and down.
Seesaw! Seesaw!
This is the way to town.

Before the actual reading is begun, two preparatory lessons on the rime are given as follows: In the first lesson the pupils are shown a picture of a little boy and girl playing seesaw, or teeter-totter. The pupils talk about having played the game and imitate it by swaying their arms up and down. In the next lesson they memorize the rime exactly and play a little kindergarten game with it. Finally, in the third lesson, the teacher writes the rime on the board. Before writing the first line she says, "What shall I write first?" The children tell her to write "Seesaw! Seesaw!" Thus the pupils' first reading lesson is prepared for in such a skillful way that they have the full meaning in mind before the symbols are presented, and they are intensely interested in telling the teacher what to write. Thus they are prepared to read it as an interesting and meaningful whole.

Recall related ideas; state aim of lesson. — Most of the above examples illustrate, as a part of the step of preparation, the practice of recalling the general field of ideas in which the pupils are to do their thinking. This recalling may be done by (1) a review of related matters previously studied, and (2) a statement of the general topic or problem or project or plan for the new period. Such a statement of the general plan or aim of the lesson not only helps to arouse in the pupil the appropriate lines of thought, but also enables him to coöperate with the teacher in carrying out the plan or attaining the aim of the lesson.

Make transitions clear; reviews, relational phrases, outlines. — The above rules concerning reviews and statements of plans apply not only at the beginning of the period but also at the transitions from one phase of the lesson to another. Unless the pupils are made aware of the transition or change, their thoughts may continue to run along the old line. In this textbook the author has endeavored to help the reader over the transitions by means of reviews and transitional sentences. Even single words or phrases such as "however," "nevertheless," "on the other hand," are important devices to use in writing or teaching in order to put the pupils in the transitional frame of mind which is desired. Building an outline on the blackboard as the lesson progresses and referring frequently to it also serve to keep pupils' minds directed along the right lines.

Creating favorable mental attitudes; curiosity aroused by problems. — The examples on pages 195–196 also illustrate the creation of certain favorable attitudes of mind as well as the recalling of a field of ideas or line of thought as discussed above. Among the mental attitudes of pupils which are especially favorable in teaching are *expectation* and *curiosity*. The latter is particularly helpful when it includes a puzzle or perplexity or problem which interests the pupils and leads them to strive to find the solution.

Interesting curious example often used to introduce larger problems. — Very often the best preparation for the study of large problems is through the discussion of some minor problem of more immediate interest. Adams gives the following example:

> Instead of starting straightway with the subject of the difference between the development of the feudal system in England and in France, the problem might be suggested, Why are there hedgerows in England and not in France? In answering this interesting question, all the essential points of difference emerge, and the incentive of a well-defined purpose is maintained throughout the lesson. (**1**: 181–182)

Playful attitudes and pleasant suggestions prepare for enjoyment. — There are many kinds of teaching, however, which do not involve problem solving. The most evident of these occur in teaching the enjoyment of stories, poems, pictures, songs, etc. The art of the preparatory steps here consists in creating a certain general emotional background which we may call "playful," and recalling certain trains of thought which contain happy suggestions to be used in enjoying the new story, or poem, or picture.

Attitude of interest of great importance; next chapter. — The arousing of such general mental attitudes as we have been discussing, namely, expectancy, curiosity, playfulness, etc., constitutes one of the largest problems in the practical art of teaching. It may be called the general problem of securing interest and concentrated attention on the part of the pupils. Interest exerts such a large influence in determining how effectively pupils learn, that we shall devote all of the next chapter to a discussion of it as the basis of economy in learning. Before turning to the next chapter, however, the reader may review with profit the summary of the present and preceding chapters as given on page 190.

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CHAPTER IX

INTERESTS; THE BASIS OF ECONOMY IN LEARNING

Main points of the chapter. — 1. An attitude of interest or attention is favorable to learning.

2. The use of interesting adventure stories in teaching reading and history illustrates utilizing children's active interests as an aid in teaching.

3. Such utilization of children's interests is a cold-blooded business proposition, not a matter of sentiment.

4. The spontaneous attention which is thus secured is more favorable than forced attention.

5. Sugar-coating uninteresting material in order to secure spontaneous attention is often justified if the attention is not misdirected.

6. In utilizing any inborn interest of pupils, teachers must consider not only its effectiveness in securing attention but also its value in the lives of persons generally and in molding the character of the pupil.

7. For a long time, fear of physical pain, fear of sarcasm and ridicule, and rivalry for marks or prizes were the chief instinctive interests appealed to by teachers.

8. Recent improved school practice tends to rely on the following instinctive interests:

a. Interest in adventure and romance.
b. Interest in actions of people and animals.
c. Desire for social approval.
d. Interest in rhythm, rime, jingle, and song.
e. Curiosity, wonder, puzzle interest, problem interest, mental activity.
f. Interest in expression and communication.
g. Manipulation and general physical activity.
h. Collecting instinct.
i. Imitative play.
j. Interest in games.

9. As a result of utilizing these interests of children, the latter learn economically to work effectively and to enjoy even difficult serious tasks.

Interest is a helpful mental attitude in learning. — In our discussions of learning processes we have emphasized the fact that a pupil learns through his own responses and that the latter are influenced in any situation by the pupil's past experience and present frame of mind. At the end of the preceding chapter we showed that the present frame of mind included not only certain fields of ideas or lines of thought but also certain *mental attitudes*, such as expectancy, curiosity, playfulness, etc. The words "interest" and "attention" are used to designate certain of these mental attitudes which are considered particularly helpful in getting pupils to make certain specific responses; that is, in directing their self-activity along definite educative lines.

Illustrated by use of interest in adventure in teaching reading. — To illustrate the importance of the attitude of interest as an aid in educating pupils, consider which of the following selections taken by Thorndike from actual school readers you would prefer to use in teaching primary children to read. The first selection, from a second reader published in 1878, runs as follows:

FOODS

We must never forget that we do not live to eat, but that we eat to live.

Our food is the flesh of beasts, birds, and fish, and the fruits of the earth.

Beef is the flesh of the ox, pork is the flesh of the pig, and mutton is the flesh of the sheep.

Apples grow on trees, and grapes grow on vines. Turnips and beets grow in the ground. . . . (**6**: 67)

Can you imagine a second-grade pupil getting up much enthusiasm about the above passage? Can you imagine him reading it voluntarily time and again and hungrily asking

the teacher for more stories about food? The next selection, from a second reader published in 1897, accompanies a picture of Longfellow, and runs as follows:

MR. LONGFELLOW

This is a picture of Mr. Longfellow.
He was the boy who lived near the sea.
He is an old gentleman in this picture. . . .
He was a poet.
A poet has beautiful thoughts.
He writes them for others to read. . . .
When he was a boy he went to school.
Then he went to Bowdoin College. . . .
He then went across the ocean. . . .
When he came back he was a teacher in Bowdoin College. (**6**: 64)

You can easily see that this selection would have more attraction for seven-year-olds than the paragraph about foods. The picture of Longfellow would excite some momentary interest, but what of the sentences that follow? Our study of apperception revealed no more ill-adapted material than discussions of Bowdoin College for seven-year-olds. Most children would certainly not be attentive to such material unless they were forced to be. Contrast now the following "thriller" from a third reader published in the same year as the story of Mr. Longfellow:

KING TAWNY MANE

There was once a lion whose name was Tawny Mane. He was so strong that all the other animals were afraid of him, so he was called the king of the forest. He liked to kill every animal that came in his way, and there was no living thing in all the land that was safe from him.

At last, one day, all the animals met to talk about their troubles, and see if they could not find some plan to save themselves from King Tawny Mane. They talked a long time, and then agreed what to do.

In the evening they went together to the lion's den. King Tawny Mane had just had a full meal, so he did not try to harm any of them. "What do you want here?" he roared.

This frightened them very much. Some of them ran back into the thick woods. But the bravest stood still. "Speak and tell me what you want," said the king.

Then Sharp Ears, the fox, stood up and spoke. (**6**: 65)

Can you imagine an ordinary child who would not be anxious to read on and find out what Sharp Ears said about the plan to send one animal each day to appease the king's hunger? Perhaps even you would like to know the adventure of little Cotton Tail which comes in the story after the following paragraphs:

At last the lot fell upon a little rabbit named Cotton Tail, and he was sent to make a call upon the king. He was in no hurry to go. He played along the road until after dinner time. Then, with big eyes and gentle steps, he went and stood at the lion's door.

King Tawny Mane was very hungry, and when he saw the rabbit he roared, "Why are you so late? Even the elephant knows better than to keep me waiting."

The rabbit bowed low and said, "I know I am late. But if you could only see what I have seen, you would not blame me."

"What have you seen?" said the lion. (**6**: 66)

Interest in adventure prominent in social life; its use is effective in teaching reading. — The interest which would carry a child or an adult through the above story is the same interest that made Homer's stories of the wanderings of Ulysses so popular with the Greeks and that now gives a popular journal a circulation of millions of copies each week. It is one of the strongest interests born in human beings; namely, the interest in adventure, in excitement, in romance. When coupled with the courageous and fighting instincts it carries thousands of red-blooded persons to all ends of the earth in search of new and thrilling experiences. At the same time it impels many of the most timid and

peace-loving to sit in their comfortable homes or at the movies, and thrill over the deeds of detectives and crooks, cowboys and hunters, soldiers and sailors, knights and their ladies. Obviously, we save much time and energy in teaching children to read if we can use this interest to keep them attentive during the reading period and to get them to read voluntarily out of school hours. Consequently many adventure stories are now read in the elementary school, from "The Three Billy Goats Gruff" in the first grade to "Treasure Island" in the upper grades.

Adventure interest also effectively used in history teaching. — The interest in adventure and romance may be used with equal effectiveness in teaching history. This may be illustrated by two examples. In a large city a young but well-trained teacher was having difficulty with a fifth-grade class, all of poor foreign parentage, in getting them interested in English history. She made a trip to the superintendent's office and secured a set of supplementary historical readers which contained tales of adventure. The children immediately became interested; the books were read in school and out. The appeal made by the stories was well illustrated by the remark of one child who called across the room to a companion, "Say, Joe, was n't Richard a peach of a guy?"

The second example of the utilization of the adventure interest in teaching history is from the middle grades in The University of Chicago Elementary School, which possesses an excellent library of children's literature and supplementary reading material, to which the children have free access. In connection with the work in history, some of the children read very widely; for example, my own boy, now in the fifth grade, reads about three hundred pages each week-end. The books read vary from the cheap but excellent publications of the textbook companies to the beautiful but more expensive books by the English writer H. E. Marshall, entitled "Our Island Story," "Scotland's Story,"

"The History of France," and "This Country of Ours: the Story of the United States." I have been interested in noting what parts my son reads and what parts he omits. He likes certain books, he says, because they are full of battles, and fights with Indians, and travel and adventures generally. Other books he will bring home from the library and return without reading them, because they lack the above elements. During my own boyhood, in the middle grades, I read five-cent novels and such books as "Ragged Dick" and "Frank on the Gunboat," to satisfy my craving for adventure stories. Obviously, when the school can divert some of the energy that ordinarily goes into such reading into historical reading, it is achieving important educational ends at small cost.

Utilizing children's interests is a business proposition, not a matter of sentiment. — The use of the strong instinctive interest in adventure as the basis for the effective teaching of reading and history in the primary and middle grades illustrates a number of general points concerning the utilization of children's active interests by teachers. The first point is that such utilization is *a purely utilitarian, cold-blooded business proposition*. There is *nothing sentimental* about it, any more than it would be considered a matter of sentiment for a traveling salesman to try to sell an improved adding machine to a business man by appealing to the man's interest in securing speed, economy, and accuracy in his bookkeeping. In the selling of most kinds of goods the salesman can assume, on the part of the prospective buyer, the existence of certain active interests which are an essential part of the latter's business activity. The salesman builds upon these in the same way that the teacher ought to build upon the active interests of pupils. The teacher does not have to create the interest in adventure; it already exists. It is an active tendency of children which daily manifests itself in their plays and games and stories and reading. The teacher

merely utilizes it and builds upon it to teach two of the most important subjects in school; namely, reading and history.

Children's interests call forth spontaneous attention in contrast with old-fashioned forced attention. — The practice of utilizing the existing interests of children as a means of securing their attention to school work may be contrasted with the older practice of merely *demanding attention* of children to material in which they have no natural spontaneous interest. This contrast may be used to denote two kinds of attention which teachers may secure; namely, *forced* attention and *spontaneous* attention. The devices used by teachers in securing forced attention included threats, demerits, rapping on the table, scolding, rewards, etc. Spontaneous attention, on the other hand, seems to come of itself, as illustrated above by the spontaneous interest in the story of King Tawny Mane and Little Cotton Tail.

Spontaneous attention more effective than forced divided attention. — Spontaneous attention is usually more effective in learning than forced attention because the latter is likely to be so *divided* that only a small portion of it is given to the lesson. This is illustrated by the pupil who is busily engaged in shooting paper darts from a rubber band and at the same time apparently listening to other pupils recite. This pupil's attention is divided, part of it being given to the rubber band, part to his targets, and just enough to the teacher and recitation to avoid being caught. That such divided attention is not very effective in learning lessons can be easily realized if the reader will call to mind his own efforts to study for an examination when a conversation in which he is interested is being carried on across the table from him and he realizes that he has only twenty minutes left in which to get ready for the examination. Or call to mind efforts to study after returning from a dance, with the mind full of alluring melodies and memories, or after laying down an unfinished and exciting book. It takes no fine psychological

measurements to show that the progress made during an hour of such divided and forced attention is often not as great as that made during fifteen minutes of concentrated, undivided, spontaneous attention to the lesson in question. In school work it is obvious that the substitution of such spontaneous, undivided attention for the forced and divided attention which is often found there would mean much more effective and economical learning.

Spontaneous attention, however, may be misdirected. — Sometimes, however, the spontaneous attention which a teacher secures is misdirected, and as a consequence the instruction is largely wasted. This fact is illustrated by the following amusing incident quoted by Thorndike, from the methods of a certain Miss Bessie with a group of primary children.

> It had seemed to Miss Bessie advisable that the children should know something of the world on which they live, and for purposes of instruction she had selected a geyser and a volcano as important — not to say interesting — features of land structure. By means of a rubber ball with a hole in it, artfully concealed in a pile of sand, she had created a geyser, and with a bit of cotton soaked in alcohol and lighted, she had simulated a volcano.
>
> We began our work with geography in ignorance of these facts. After a few lessons on hills, mountains, islands, capes, and bays the children informed us that they "did n't like those old things." "Please won't you give us the fireworks," asked Freddie. "Or the squirt?" added Agnes, eagerly. (**6**: 63)

Sugar-coating may be justified if it secures properly directed attention. — Such examples have led some educators to condemn all sugar-coating to secure interest, but it is possible to justify some sugar-coating by distinguishing between harmful and useful forms of it. Miss Bessie's device was harmful because it merely secured attention to the fireworks and did not secure attention to the geographic facts to be taught. Contrast with it the following method of

sugar-coating drill upon fractions. A fifth-grade teacher has a pack of cards with a fraction such as $\frac{2}{9}$ or $\frac{3}{4}$ printed on each. She stands before the class, writes a multiplier such as $\frac{1}{2}$ on the board, and then flashes the cards, one at a time, the pupils giving the answers rapidly in turn. A record is kept of the time consumed. It is written on the board in a column containing the records of previous days with the same cards, and paralleling the record made by another class. *The fraction drill thus becomes a competitive game.*

It is just as much a sugar-coating device, however, for securing interest and zest in drill on fractions as Miss Bessie's fireworks were sugar-coating for geographic facts. The sugar-coating character of the game is shown by the fact that it has no essential connection with fractions, but could be played with any kind of material on cards, such as sums in addition, names of historical characters, dates of important events, geographic facts. This sugar-coated drill, however, is justified because it *secures concentrated attention exactly where it is desired*; namely, upon each fractional operation in multiplication as the card is flashed. Not only is the child attentive who is called on, but all the class are on their toes, helping him mentally, as it were, in the same way that a coach on the sidelines takes part mentally in each play made in baseball, football, or basketball. Scientific measurements show that such a drill game does actually bring great improvement in skill and speed in arithmetic; hence it is a sugar-coating device that is justified, not only because it secures concentrated attention where desired but also because objective, precise measurements of results prove its effectiveness.

Ultimate consequences of using an interest must be harmless. — Another general question about interests which is illustrated by our example of the use of adventure material in teaching reading and history concerns the ultimate consequences of the utilization of the interest concerned; for

example, does more harm than good result from having children read adventure stories like "King Tawny Mane" or the adventures of Richard the Lion-Hearted? The answer varies with the instinctive interest concerned and the way it is used. In the present case we may infer the answer from the fact that many great men, including President Wilson, take much delight in reading detective stories such as those of Sherlock Holmes, and many college professors, and even college presidents that I have known, are regular readers of the *Saturday Evening Post*. It could be easily shown that such adventure reading by the general public is usually a harmless form of enjoying leisure time. Hence we could conclude that similar reading by children is not reprehensible.

Three questions in evaluating use of an instinctive interest. — On the other hand, we might conclude that the ultimate results of utilizing a given instinctive interest in school were unsatisfactory and decide against it. In thus evaluating the use of any inborn or instinctive tendency as the basis of securing interest in school work, we may consider at least three questions; namely:

1. What part does the instinct play in the lives of people generally?

2. Is it effective when used as the basis of attention and interest in teaching?

3. Are the present and ultimate educational results of utilizing it satisfactory?

Illustrated by application to instinct of emulation. — To illustrate the application of these questions, let us consider the use of the instinct of emulation in instruction from the standpoint of each question.

1. *Emulation an important cause of social striving.* — Emulation, or rivalry, is one of the most impelling motives in social life. In fact, Veblen, in his "Theory of the Leisure Class," maintains that "pecuniary emulation" (that is, the

desire to possess more wealth or position or power than someone else) is at the basis of most social striving and many phases of social organization. He gives examples which vary from the savage, who can show the obvious trophies of the chase as evidence of his power and wealth, to the American millionaire whose unused mansion on Fifth Avenue or Riverside Drive in New York, and whose jewel-bedecked wife in the golden horseshoe at the opera, serve the same purpose by being tangible evidence that he has so much money that he can afford to spend it in perfectly useless or unnecessary ways. Such persons, and in a small way many others, are not striving for necessities or even for luxuries; they are simply striving to get *more*. At first they strive to get more than some persons and as much as certain others in order to be considered in the class with the latter. Having attained this point they are not satisfied, but continue to strive to secure more than their present equals in wealth or power or position, in order to have as much as some other individual or group higher up in the scale of quantity. Thus the striving is always going on, bringing with it many material improvements in life and at the same time producing much unhappiness, but leaving no doubt that emulation is one of the most influential causes in social endeavor.

2. *Emulation has been effectively used in schools.* — When we regard emulation from the standpoint of our second question, namely, its effectiveness when used in instruction, it becomes evident that it can be made just as influential in school as it is in social life at large. If prizes, rewards, honors, and position are held up for competition, the striving of students to attain them commonly becomes intense and vigorous. If the conditions of the competition are so arranged as to give a chance to pupils of all degrees of ability, the stimulus affects large numbers. The large possibilities of using emulation as a motive were most thoroughly worked out by the Lancasterian monitorial schools

whose monitorial system as used in New York City was described on page 69. Children were given tickets each day according to their success in various subjects. After a sufficient number of tickets had been accumulated these could be exchanged for badges of honor, or books, or even pocket knives and toys. Similar devices were widely used in certain Sunday schools. A description of this practice is given by Mark Twain in "Tom Sawyer," in the chapter entitled "Showing off in Sunday School."

The action is supposed to take place about 1840. The description opens with a picture of Tom at the door of the church on Sunday exchanging fish hooks, sticks of "lickrish," marbles, and other trifles for "yaller" tickets, blue tickets, and red ones. During the period before Sunday school opened, Tom carried on these high financial operations so successfully that he had accumulated a large supply of tickets by the time the pupils took their seats to recite their lessons. The children who were successful received one blue ticket for every two verses which they recited. On the ticket was printed a verse from the Bible. Ten blue tickets could be exchanged for one red one, and ten of the latter for a yellow ticket. Finally, after the pupil had earned ten yellow tickets he received in exchange for them a Bible. According to the story, Tom's conscientious sister, Mary, had, during two years, earned two Bibles in this manner while the "teacher's pet" had earned four or five. The ceremony of giving a child the Bible which he had earned made him so conspicuous that he was envied by all the other children who were spurred on to greater efforts in emulation of him.

Doubtless the reader recalls the dire adventure which befell Tom in his efforts to attain fame and prominence by the method of high finance instead of the slow process of memorizing verses. If you do not, you may spend a pleasant quarter of an hour reading the incident in Mark Twain's own inimitable account of it. For our present purposes, we

are merely concerned with it as an example of the practice which prevailed so generally in Sunday schools, of appealing to the instinct of emulation to spur pupils to greater efforts in their studies.

In public schools to-day teachers often place the names of children on the board with red stars and yellow stars opposite them to indicate various degrees of success. The general testimony concerning such appeals to emulation indicates that they are quite effective in getting many pupils to study attentively and diligently.

3. *Are the total effects of using individual emulation unsatisfactory?* — However, when we come to consider the total influence of appeals to emulation, we find ourselves in a dilemma. Many idealistic educators disapprove entirely of the use of emulation and rivalry in schools, because, they say, this practice merely increases in each pupil the tendency to scramble for more wealth or power, and that this selfish tendency is the basis of many social evils. Not only in social life but also in school, they say, it tends to develop unhappiness, hard feeling, and deceit.

Children's play is naturally strongly competitive. — On the other hand, if we watch children at play, we find emulation such a large feature that Kirkpatrick says, "Competition is the most prominent element in the play of children from seven to twelve." (**4**: 157.) Since much of the energy of children during this age is spent in such competitive play, it makes us wonder whether playful competition is, after all, such a pernicious matter. Certainly in the play of children it does n't develop an overwhelming amount of unhappiness and hard feelings but, on the contrary, seems to be an essential feature of their happiest moments.

Rivalry in social life may be directed to worthy ends. — Further light is thrown on our dilemma by examples from social life where competition, or rivalry, is used in the pursuit of some worthy end, such as raising funds for the Red

Cross. In this case, cities or teams or individuals compete vigorously with each other, but the harder they compete, the harder they are working for a desirable social outcome.

Emulation being directed in schools to secure beneficial results. — Possibly the answer to our dilemma would be that emulation or rivalry is not in itself a pernicious tendency but, instead, is one of the most useful of human instincts in bringing about self-improvement and social improvement. The problem of directing it in social life so that people will compete in socially helpful ways is being solved by democratic governments which are restricting more and more the opportunities for individuals to acquire enormous fortunes and power and are interesting the efficient, competitive persons more and more in public enterprises. The problem of utilizing rivalry in schools is being solved not by eliminating it but, *first*, by setting up certain *standard scores* in arithmetic, handwriting, spelling, etc., and certain model achievements in other subjects which pupils become interested in equaling or beating, and, *second*, by having *groups and classes compete* with each other as illustrated in the fraction game on page 208. In these forms, the increasing use of well-directed competition is one of the most striking features of recent improvements in school-teaching.

Summary of discussion of general aspects of interest and attention. — In our discussions of interests up to this point, we have noted the following ideas: (1) that interest is a helpful attitude in learning, as illustrated by the effective use of the adventure interest in teaching reading and history; (2) that utilizing children's interests thus becomes a good business proposition; (3) that the explanation of the value of using children's interests is found in the fact that they are the basis of spontaneous attention; (4) that care must be taken in using children's interests to see that their attention is not misdirected; (5) that if attention is properly directed, devices for sugar-coating uninteresting material are

often justified; and (6) in utilizing any inborn instinctive interest we must consider not only its effectiveness in getting certain present results but also its ultimate influence on the character of the pupil and in social life after school.

Important instincts used as basis of attention and interest. — In presenting these general facts about interests, we used as examples two very prominent instinctive interests; namely, the interests in adventure and in competition. *These are called instinctive because they originate in certain human characteristics which are inborn*; that is, are not the result of experience. We shall continue our discussion of utilizing children's interests as the basis of economy in learning by discussing a number of these instinctive interests, as follows:

A. Those used before Rousseau's humanitarian appeal to base teaching upon the instincts and capacities of childhood.

1. Fear of physical pain.
2. Fear of sarcasm and ridicule.
3. Rivalry for rewards and position.

B. Interests used in accordance with Rousseau's humanitarian, psychological method.

1. Interest in adventure and romance.
2. Interest in actions of people and animals.
3. Desire for social approval.
4. Interest in rhythm, rime, jingle, and song.
5. Curiosity, wonder, puzzle interest, problem interest, mental activity.
6. Interest in expression and communication.
7. Manipulation and general physical activity.
8. Collecting instinct.
9. Imitative play.
10. Interest in games.[1]

[1] *Precise psychology of instincts.* — Students of psychology who desire to reduce this list of instinctive interests to its simplest components should read Thorndike's "Educational Psychology," Vol. I. The *terms used above* are chosen because they are readily understood by eighteen-year-old students who have had no psychology. The *order of presentation* of the interests is also determined by the apperceptional needs of such students.

1. **Fear of physical pain generally used until 1800.** — It is hard to realize that in western Europe for hundreds of years the principal means of getting pupils to study their lessons was fear of physical punishment; but this was the case. There is plenty of evidence in the pictures of old-time schools, in the appeals to abolish the practice which were made by such famous writers as Erasmus (1466–1536), Comenius (1592–1670), Ascham (1515–1568), and Mulcaster (1530–1611), and in the records of the number of whippings given by schoolmasters. The picture on page 217, in which a large bunch of switches is held ready in each master's hand, is typical. The switches were held in such a convenient position, not because the boys were likely to be unruly or insubordinate but in order that the teacher might give a blow for each mistake as soon as the pupil made it while reciting.

Apart from the fact that for humanitarian reasons such punishment would not be tolerated at the present time, it would not be used because it is obviously ineffective. Instead of securing spontaneous attention, at the best it secures forced, divided attention under conditions that are very unfavorable to mental progress. For these reasons the use of the instinctive fear of physical pain as a stimulus to attention was generally discarded after the beginning of the nineteenth century.

2. **Fear of sarcasm and ridicule.** — Somewhat akin to the appeal based on the fear of physical pain is that based on the instinctive fear of sarcasm and ridicule. This form of stimulus is still used by many teachers, who regard it as an effective instrument. Such teachers practice the use of sarcasm and ridicule as an art, and develop a vocabulary of stinging terms and expressions calculated to make the laziest pupil apply himself in order to avoid a repetition of the ridicule. It is true that such methods are often effective in securing attention and effort on the part of the pupil, but attention

secured in this way is likely to be forced and divided and, hence, relatively ineffective as compared with spontaneous attention. If some means of arousing the latter can be devised, it would be better to omit sarcasm and ridicule. Moreover, the unhappiness which these cause most pupils to suffer and the unfriendly relations which they tend to establish between teacher and pupils furnish additional reasons for avoiding their use under ordinary circumstances. Certain mild forms of good-humored ridicule, in which the lazy or careless pupil becomes the object, for the moment, of mild, friendly bantering by the teacher, would be the exceptions to the general rule of eliminating ridicule as a stimulus to attention.

3. **Emulation.** — The transition from the use of the fear of physical pain to the use of emulation represents a definite historical advance and was so regarded by the two large systems that used emulation extensively; namely, that of the Jesuits (1540), discussed above, and the Lancasterian monitorial system, which was adopted extensively in the large cities in the United States from 1805 to 1830. In view of the long evaluation of the use of emulation given above (pp. 209-213) nothing more need be said concerning it.

Other instinctive interests of children utilized recently. — As a general rule the fear of physical pain and of sarcasm and ridicule, together with appeal to emulation, constituted the instinctive bases for securing the attention of pupils until the reforms proposed in Rousseau's "Émile" began to affect school practice. As we have noted several times, Rousseau said to study childhood, particularly the instincts and capacities of children, in order to determine how they learn most readily and effectively. In his program he emphasized especially the use of children's instinctive interests as the most economical and effective method of securing attention. While later educators have departed somewhat from Rousseau's account of what children's interests are, his general idea of basing teaching upon children's instincts is

A BLOW FOR EACH MISTAKE

A medieval Latin school. Notice the "I'll-get-you-yet" leer in the eyes of the principal teacher, ready, with switches poised, to punish for each mistake in translation or grammar. Notice the assistant teacher circulating with his switches to distribute blows where needed. See discussion on page 215

being carried out more and more in teaching. The following paragraphs will consider some of these interests of children which have gradually replaced in schools reliance on fear and on rivalry for prizes and material rewards.

1. **Interest in adventure and romance.** — We have already shown on pages 201–205 how the common instinctive interest in adventure and romance is used in securing an interest in reading and history. All the examples given there concerned *boys* who had shown a strong interest in adventure stories. It is important to keep in mind that little *girls* are often just as much interested in such stories as are boys. This is charmingly pictured in the foreword of "Scotland's Story," by H. E. Marshall, several of whose books are dedicated to little girls. The foreword reads in part as follows:

WHY THIS BOOK WAS WRITTEN

"It is very nice," said Caledonia, as she closed her book with a sigh; "but why did you not tell us stories of Scotland?"

"Because there was no need. That has been done already by a great and clever man."

"Oh, but children sometimes like the stories which are written by the *not* clever people best," said Caledonia, wisely. "Littler children do, anyhow. They are more simpler, you know."

"Oh, indeed!" said I.

"I wish you would write 'Scotland's Story' for littler children like me," went on Caledonia, "and please put more battles in it than in 'Our Island Story.' But you must not say that the Scots were defeated. I don't like it at all when you say 'The Scots and the Picts were driven back.'"

2. **Interest in the actions of people and animals.** — Closely related to the interest in romance and adventure is the common interest in the actions of people and animals. This interest persists throughout life. *Infants* will notice and watch persons and dogs, cats, horses, and cows with the greatest ardor, while, at the opposite extreme, most *adults*

get their chief leisure enjoyment in life from mingling with crowds, watching people stroll or play or work, and in talking gossip about people and reading about people in fiction and in accounts of daily events. Adults are also greatly interested in animal pets. During the period when children are in the primary and middle grades, the interest in the actions of animals and people is especially strong. Their fondness for pets is well known, while their interest in the movies is sufficient in itself to prove their interest in the actions of people. These interests, combined with the interest in excitement and adventure, result in their enthusiasm for such stories as "King Tawny Mane," "Little Red Riding Hood," fairy tales, etc. By using these interests as a point of departure, almost any phase of social life which children can understand can be made of interest to them. For example, Rousseau proposed to use the story of Robinson Crusoe as an introduction to the study of the wants and industries of people. This suggestion was carried out in great detail in certain elementary schools not long ago. One needs only to look through a library, and to ascertain what manifold phases of human life have been represented in story and romance, in order to appreciate what wide use may be made of the instinctive interest in the actions of animals and people to secure the spontaneous attention of pupils to many important topics and activities. In our earlier chapters we have given a number of illustrations of useful learning which starts with these interests; namely, (1) the child who became interested in Bible reading through adventure stories, movies, and the battles of the Greeks and Persians (see page 49), (2) basing the study of history on the adventures of the Vikings, of Greek heroes, of Horatius at the bridge, and on the lives and customs of historic peoples (see pages 135–140); and (3) keeping pets as the source for a number of lines of instruction in the kindergarten and first grade (see pages 170–173).

3. **Instinctive desire for social approval; the basis of fashions and forms of social control.** — The third instinctive interest which we shall consider is the desire for the approval of persons, for social approval. The utilization of this instinct in the negative form of fear of sarcasm and ridicule and the unhumanitarian character of such use we discussed on page 215. The opposite practice of positive personal approbation by the teacher is not unhumanitarian, however, and is being widely used in home and school. The effectiveness of both of these phases of the instinct in stimulating or depressing people is described by Thorndike in the following statement:

Darwin long ago noted the extraordinarily ill-proportioned misery that comes from committing some blunder in society whereat people involuntarily "look down" on one for an instant. Except for him little attention has been paid to the [inborn character] of the hunger of man for the externals of admiration and the intolerability of objective scorn and derision. Yet these forces of approval and disapproval . . . are and have been potent social controls. For example, the "discipline" of a humane home or school to-day relies almost entirely upon such approval from above, and finds it even more effective than severe sensuous pains and deprivations. The elaborate paraphernalia and rites of fashion in clothes exist chiefly by virtue of their value as means of securing diffuse notice and approval. . . . The institution of tipping, which began perhaps in kindliness and was fostered by economic self-interest, is now well-nigh impregnable because no man is brave enough to withstand the scorn of a line of lackeys whom he heartily despises, or of a few onlookers whom he will never see again. (**8**(*b*): 31)

Teacher's approval especially desired in primary grades. — Speaking of the utilization in school of the desire for social approval Kirkpatrick says:

At first [the child] cares most for approval of parents, later of teachers, then of companions. . . . In the early years parents and

primary teachers who have the love of their children may get them to do almost anything by appealing to the desire for personal approval; but as children get older, they care more and more for the public sentiment of their social group. The successful grade teacher must therefore learn to understand, mold, and use public sentiment in governing her school. (**4**: 123)

Encouraging atmosphere of a first-grade room. — The general tone of a first-grade room in which the teacher appealed strongly to the children's desire for social approval is suggested by the following remarks which she made. The children were getting ready for dismissal. The teacher said, "I want to see if these nice ready boys can take their seats quietly"; whereupon the boys strutted proudly to their seats. Later she said, "Now show me the first people that are ready." During a writing lesson she said, "I am coming around to see which papers are the neatest. . . . Donald's is very nice because he has good spacing. . . . Who are the first ones ready with pencils and tablets put away? There, Richard is the first one ready again." When the other section came walking in on tiptoe, the teacher said, "What nice toes they have to-day!" The children smiled and were proud of the impression they had made. During a reading lesson, when a child expressed an idea well, the teacher said, "Yes, that's it," in an approving tone. It was interesting to note that even such slight expressions of approval were treasured by the children. Doubtless the reader can recall from her own experiences as a pupil occasions when a few words of approval from a teacher have sung in her memory for hours or days afterward.

4. **Interest in rhythm and rime, jingle and song.** — The interests in rhythm and rime, jingle and song are such large factors in the lives of children and adults that they offer important possibilities in school-teaching. Their importance in adult social life is suggested by the fact that they are basic factors in the enjoyment of dancing, music,

and poetry. If you will read the history of Greek art, early features of which were festival dances at the time of harvesting the grapes, you will see how the simple fundamental instinctive interests in rhythm and song may be developed gradually into the highest forms of art. That children are fascinated with rimes and jingles is shown in their enthusiasm for Mother Goose rimes, for skipping games, etc. The possibilities of utilizing these instinctive interests were early recognized in the kindergarten, where rhythmic activities, such as skipping, clapping, marching, dancing, and singing are prominent features. In teaching beginning reading, nursery rimes such as "Old Mother Hubbard" and "Little Jack Horner" were introduced into the first grade only a few years ago, but are now widely used. One of the most recent innovations in the use of rhythms in school is the carrying on of handwriting drills in rhythm, — in the primary grades while reciting "Seesaw, Margery Daw, up and down we go," and in the upper grades while a metronome is ticking. The effectiveness of the use of such rhythms in handwriting drills is not merely a matter of opinion, but has been proved by precise objective measures.

5. **Curiosity, wonder, puzzle interest, problem interest, mental activity.** — An important group of instinctive tendencies and interests is suggested by the words "curiosity," "wonder," "puzzle interest," "problem interest," "mental activity." Of these, the term "curiosity" is perhaps most suggestive of the mental tendency to which we refer. An example of its occurrence was given on page 203 in quoting merely certain portions of the story of King Tawny Mane. The second portion ended thus:

"What have you seen?" said the lion.

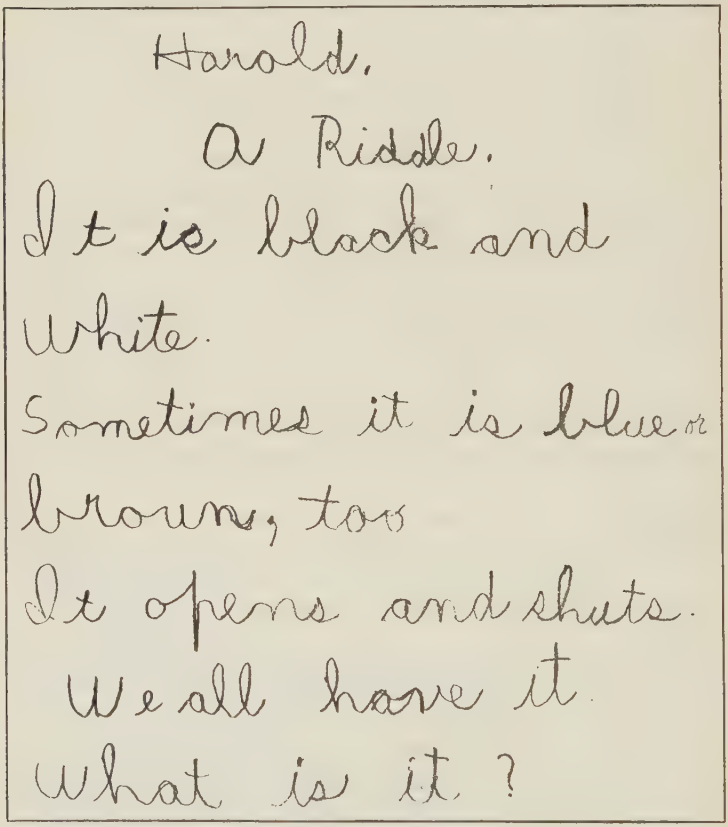
I imagine that many of the readers of this book by this time would like to know what Little Cotton Tail *had* seen. If so, you can satisfy your curiosity by reading pages 65–67 of Thorndike's "Principles of Teaching," where the whole

story appears and from which our portions were quoted. In doing this you will be paralleling the mental action of the reader of a story in a periodical who suddenly encounters "continued next week," a mental action which includes not only a vague feeling of wonder but also a definite craving for further reading and an active tendency to procure the next installment of the story. This type of mental unrest and craving is a factor in the recent improvements in organizing reading material for children. Such material, at its best, must not only include actions and adventures of animals and people, but must be so artfully written as to maintain the element of suspense throughout.

Popular science illustrates wonder about nature, used in geography. — Curiosity and wonder concerning facts of nature and geography are illustrated by the common interest in reading magazines of popular science and the strange and weird happenings that are recounted in the "patent insides" of rural and small-town newspapers. The legitimate utilization of such curiosity and wonder in teaching geography was illustrated in the use of pictures of remote regions in beginning the study of North America as described on page 117.

Mental striving involved in puzzle interest; riddles used in composition. — When the curiosity which has been aroused is to be satisfied not merely by further reading, looking, or listening but by reflective study, we have involved the instinctive *puzzle* interest or *problem* interest. This interest or form of mental striving may be aroused in adults and children by even the most foolish and useless issues. Mechanical puzzles furnish excellent illustrations; for example, on a canoeing trip I watched an Indian guide, a very intelligent white guide, and a very efficient business man spend much time fascinated in the efforts to untangle a wire puzzle. The popularity of riddles with adults and children are further examples of the fact that perfectly foolish puzzles arouse the

problem interest. Some teachers use riddles as a means of arousing the pupils' interest in the primary grades in writing


Harold.

A Riddle.

It is black and
White.
Sometimes it is blue or
brown, too
It opens and shuts.
We all have it.
What is it?

A SECOND-GRADE COMPOSITION WHICH UTILIZES THE PUPIL'S INTEREST IN RIDDLES

sentences, the children becoming fascinated in composing, writing, and solving such simple problems as the following:

What has a face and no mouth?
What has teeth and cannot bite?

Even first-grade children may coöperatively compose comparatively long riddles, as shown in the following example, which provided an interesting basis for much training in expression.

A RIDDLE

We have two little pets in our room. We will give you a riddle about them. Will you try to guess it?

They live in a wire cage. They climb all over it. They are white and small, and have pink eyes, noses, claws, ears, and tails. Their tails are long, which helps them in climbing.

Our pets eat wheat, bird-seed, crackers, toast, and cake. They wink their noses when they eat, as a bunny does.

They make a nest of cotton. When they don't want us to bother them they cover it all over with sawdust and make a new hole.

They sleep during the day and wake at night. They climb on our arms and try to go up our sleeves.

Can you guess what they are? Here they are spelled backwards, *etihw ecim*.

Popular composition books for the middle grades get children interested in writing compositions descriptive of different animals or different cities which, however, are not named in the compositions, and then having members of the class guess what animal or city is described in each composition as it is read.

Puzzle or problem interest easily aroused regardless of practical value. — A teacher can arouse the puzzle or problem interest of a class by almost any kind of problem which they can understand, regardless of its practical value to them. In my own classes, my favorite device when the students begin to lose interest in the realities of practical teaching is to raise some interesting theoretical problem to revive their interest. For example, not one person out of twenty-five members of my class may ever have occasion to teach a foreign language to children under twelve years

of age, but it is perfectly easy to get the whole class interested in discussing whether children learn a foreign language more readily than adults, particularly when I assert that it is my opinion that college students learn a foreign pronunciation and vocabulary much more quickly than little children do.

Many university investigators impelled merely by desire to solve puzzling problems. — Further examples of the interest of adults in solving problems regardless of their so-called "practical" value is found in the work of university students and professors. Readers of this book may not be familiar with these facts, but it is true that many of the investigations carried on in certain departments in universities have no other motive than the "ascertaining of truth"; and the investigators are impelled to carry on the investigations merely by the desire to determine what the answer to some puzzling problem is.

The real bite of a puzzling problem arouses mental striving. — Thus we see that the puzzle or problem interest is manifested in children and adults in various types of situations varying from the relatively foolish interest in puzzles and riddles up to the advanced scientific interests in theoretical investigations. The existence of this general puzzle interest gives the school one of its best opportunities to provide valuable training through merely utilizing the instinctive interests of children. Such training not only develops skill in problem solving, which is socially very valuable, but also keeps the pupil actively at work in mastering subject matter in history, geography, and other subjects. In order to arouse in many pupils intense mental striving to solve the problem, it is only necessary, *first*, to make sure that the problem is adapted to their past experience and understanding, that is, to provide for the principle of apperception, and, *second*, to lead up to the question in such a manner that the pupils are really puzzled about it. With many children additional interest in a problem is aroused by appealing to competition

or rivalry in its solution. Some children who will strive to solve a problem in a group where they have a chance to show off or to compete with others would take little interest in the same problem if required to work on it by themselves with no competitive social element entering in.

Examples of problems which have appealed to pupils. — Examples of problems which have actually been used successfully in puzzling children and getting them to strive for the solution are given below.

(1) *Constructive* problems are particularly prominent in the kindergarten and primary grades; for example, in the kindergarten: "How can blocks be piled so as to make a bridge across this imaginary stream chalked on the floor?" or "How can a slanting roof be made on this house so it will shed the rain?" or, given the paper pattern for a doll's dress, "How shall it be placed on the cloth in order to work out the dress?" or, given certain pieces of paper, "How can they be folded so as to make little baskets or boxes to hold the seeds from the garden?"

(2) Problems of *social needs* are also a prominent feature of the work in the primary and middle grades; for example, in studying the Vikings in the third grade, the children were asked, "How, probably, did the inhabitants of old Norway get from one part of their country to another? What kind of boats do you think the people made at first?" Later, in the study of the water supply of Chicago, the children are interested in such problems as, "Where in the lake do you think the water is clearest? Do you think pipes could be laid out there? How could the freezing of the pipes in winter be prevented?"

(3) In the middle and upper grades more complicated problems of *cause and effect* interest the pupils; for example, in the sixth grade, in studying the period of exploration such questions as the following appeal if properly approached: "What did Vasco da Gama's voyage do for Portugal? In

what way would this direct route benefit Portugal? How would it benefit western Europe? How would this affect the cities of Genoa, Venice, and Florence?" In geography, the children themselves constantly ask, "Why is it so? Why do one half of Canton's people live in boats? Why is China so crowded when she has so much room? Why does n't she work her coal mines?"

Mental activity is a pleasant pastime. — The terms "curiosity," "wonder," "puzzle interest," and "problem interests" may all be included in the broader instinctive interest in mental activity. Concerning this, Thorndike says:

> The instinct of general mental activity is the fountain head of human intellectual development and has been in the past the chief support of school education. Unlike almost all other animals, man thinks not only under the stress of some immediate practical need, but at all times and for the mere enjoyment of thinking, — thinks not only about the few particular objects that feed, warm, protect, or injure him, but about everything he experiences. . . . The child watches and listens to all sorts of objects even when they have no meaning for his bodily needs. For to the human being intellectual life is as truly a need as food or safety.
>
> Children do not have to be enticed or forced to think and learn. They seek ideas as eagerly as food. Only when it involves restraint, monotony, and futility is thinking objectionable. The teacher's problem is to preserve the force of the original instinct of mental activity by giving it exercise and by rewarding its exercise with satisfaction, and to guide the aimless, random thinking of children into useful and rational forms. (**6**: 25)

6. **Interest in expression and communication stimulates conversation.** — The tendency to talk is a very prominent characteristic of children and adults. Generally it takes the form of a desire to talk *to someone*, although when individuals are deprived of company for a long time, they often talk to themselves. Some persons are so extremely talkative that they become irrepressible bores, while others are so

taciturn and reticent that their communication consists merely of monosyllabic grunts. On the average, however, the desire to share one's ideas and experiences with others leads most persons to tell "the news" to their friends on all occasions and to discuss their problems and worries whenever they can find a sympathetic, friendly audience.

The new basis of recitations and training in expression. — Until recently this interest in communicating one's experiences, problems, and ideas was almost entirely unused in school; in fact, it was generally repressed, children merely being allowed to recite stuff that most of the class already knew. Recent improvements in teaching make the instinctive interest in communication the basis of two of the most important features of school work; namely, the conduct of many recitations and the training in expression. In both of these cases such situations are created that certain pupils have experiences and ideas to relate that other pupils do not have, and an interested and sympathetic audience consisting of the teacher and pupils is thus provided. Not only talking, but also communication through writing and drawing are utilized and stimulated in this manner. For an example of the use of drawing see the frontispiece.

7. **Manipulation and physical activity; basis of sports, arts, and industries.** — That most children like to handle things and to run, jump, skip, hop, dance, etc. is a matter of common observation. As in the case of the general instinct of mental activity, so in this case, Thorndike's evaluation of the instinct is particularly illuminating as expressed in the following words:

> The instinct of general physical activity with its special form, the manipulation of objects, is the original source of sports, industries, and arts, and is in childhood the prime ally of intellectual development. As children think for the sake of thinking, so also they move about and handle objects just for the love of action and of the new ideas which action brings. The dog does a few things

Courtesy of The University of Chicago Elementary School

UTILIZING CHILDREN'S INTERESTS IN ROMANCE, ADVENTURE, MANIPULATION, AND ARTISTIC EXPRESSION TO TEACH HISTORY

See story on opposite page

to a small variety of objects and can become a hunter, eater, and carrier; the child does all sorts of things to almost everything and can become a talker, a writer, carpenter, violinist, and hundreds of things besides.

One aim of the school is to direct the force that makes children run, jump, tumble, dance, wriggle, poke each other, seize and throw, into play and work that shall be healthy for mind and body, and to direct the force that makes children play with utensils, toys, and the like toward the arts and industries that have most educative value. Even where the action and manipulation are of no value in themselves, they may be desirable as means to intellectual or moral ends. We work against nature when we try to keep young children still. To learn by doing something is to learn with the full help of instinct. And we all know that it is for idle hands that Satan finds mischief. (**6**: 26)

Examples of use of physical activity in schools. — The instinct of physical activity was first extensively used in the kindergarten, where such activities as piling blocks, cutting

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Story of the picture on opposite page. — The historical construction project shown on page 230 was worked out by a fifth-grade class in a manner similar to the description on page 9. The children had read Howard Pyle's "King Arthur" and had listened to Scott's description of the tournament scene in "Ivanhoe." After considerable discussion and planning, a committee of three children constructed in plasticine the castle shown at the left. For its plan they followed the large illustration shown hanging in the picture on page 232. Other children constructed the moat, the roadway, the inclosure for the tournament; many children were engaged in constructing the pavilions on the right for the king and queen and the lords and ladies. The costumes for the doll characters called for considerable knowledge and ingenuity. The periods for manual training and for history for about one week centered in this project.

The picture illustrates clarifying and vitalizing children's ideas of history through the utilization of their interests in romance, adventure, manipulation, artistic expression, and imitative play.

Courtesy of The University of Chicago Elementary School

VARIED RESULTS OF WORK ON SAME TOPIC BY DIFFERENT CLASSES, ILLUSTRATED BY COMPARING THIS PICTURE WITH THOSE ON PAGES 8 AND 230

See story on opposite page

paper, weaving, modeling in clay, tossing, catching, running, skipping, clapping, marching, etc. were used as the basis of giving social training and training in expression. Gradually kindergarten activities have found their way into the primary grades, where they are used in the same manner; that is, not only to give training in manipulation, marching, etc., but to provide interesting forms of self-activity for children in learning reading, arithmetic, nature study, history, and geography. Even as high as the fourth grade, as described in the example on pages 13–17, basket-weaving may be carried on as a means of teaching certain facts about industry. Other examples of the use of physical activity in teaching other matters than bodily skill are the following:

(1) Making a miniature farm in the first grade as described above on page 135.

(2) Making Indian dresses, weaving Indian rugs, making bows and arrows, etc. as shown in the picture on page 132.

(3) Twirling wool in an effort to make thread, using various simple mechanical devices in connection with a study of shepherd life as shown on page 14.

(4) Making Viking and Saxon villages as shown on pages 138 and 185.

(5) Cutting paper dolls and dressing them in tissue-paper clothing to represent types of dress worn by different persons studied in Greek history.

Story of the picture on opposite page. — The poorly focused but instructive picture on page 232, when considered in connection with the pictures on pages 8 and 230, illustrates the varied outcomes from the planning by different groups of children in the same grade with the same topic. It is this planning, this historical and constructional thinking, that furnishes the most valuable features of these projects. The actual construction is a comparatively simple matter for the subdivided labor of a group of children who have had some little training in working with clay, plasticine, cardboard, costumes, and colors.

(6) Modeling an irrigation system as shown on page 186, and representations of scenes in Roman life as shown on page 184.

(7) Constructing castles in studying medieval history as shown in the pictures on pages 8, 230, and 232.

8. **Collecting instinct.** — The tendency to collect simply for the fun of collecting is another instinct whose strength is easily recognized from common observation. It appears in the tendency of children to collect tags, coupons, stamps, dolls, postcards, and objects of every description. Among adults we find the tendency manifested in the collection of curios, books, works of art, etc. The tendency varies enormously between individuals, some making practically no collections, while others devote years to collecting a single type of object, such as books or jewels. The general social interest in collections is shown in the popularity of museums of art and natural history and in fairs and expositions.

In school the collecting tendency is first utilized in having children bring single objects to illustrate or contribute to some *group* activity; for example, in the kindergarten each child may be asked to bring an American flag on a holiday, or to bring some empty box, as a cocoa box, to use in the play store.

Individual collections may early be started with the assistance of the teacher, particularly in the form of pasted scrapbooks made of manila paper. Thus in the course of study described on pages 135–139 the first-grade children made a Farm Book, the third-grade children made a Chicago Book, etc.

A most elaborate and instructive example of such pasted collections occurred in the work of a teacher during one year in Grades 3 A and 4 B. During this year she assisted the children each to make a Boat Book, a Greek History Book, a Book of North American Pictures, a Book of Fur-Bearing Animals, and a Poem Book. Each child's Boat Book contained postcards and pictures cut by him from magazines and

steamship folders. The North American Book of Travel and Industry was also an individual product of each child's labors and illustrated imaginary trips to Florida, California, the Canadian Rockies, etc., and the great industries of farming, grazing, mining, and manufacturing. The Greek History Book contained material developed in class or provided by the teacher, and included pictures of Greek scenes, poems about the Greeks, paper dolls dressed in Greek costume, and compositions by the children.

The making of any one of these scrapbooks resembles an important part of the activity in writing such a book as this one. If the reader will run rapidly through it, he will notice that it consists largely of collections of four kinds of materials; namely, examples of school-teaching, pictures, quotations from other writers, and exact bibliographical references. These are tied together by the general discussion. The collection of these materials occupied more of my time than the actual writing of the book.

Thus we see that the collecting instinct and activity which is such a prominent feature of human nature may be utilized as the basis of interest in many practical activities in or out of school.

9. **Imitative play reproduces social activities in kindergarten; dramatization.** — An important complex of instinctive tendencies is suggested by the term "imitative play." Playing house, playing store, playing with dolls, and playing fireman and policeman are common and useful examples. The imitative feature in such cases is obvious; the children, in play, are carrying on activities which resemble those of other persons whom they have observed. The children's activities are *called play because they are doing them for the fun of the thing, for the pleasure which comes from the activity itself.*

The educational possibilities of these plays as used in the kindergarten were suggested in the statement concerning

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THIRD-GRADE DRAMATIC PROJECT UTILIZING CHILDREN'S INTERESTS IN ADVENTURE, COMMUNICATION, IMITATIVE PLAY, AND EMULATION TO VITALIZE HISTORY TEACHING

See story on opposite page

the aims of kindergarten activities on page 18, where it was stated that they give training in social and moral relations, in problem solving, in expression, in aesthetic enjoyment, and in manual skill. The actual use of a play house, a play grocery store, and other community buildings in order to secure these forms of training was described on pages 126–127. Under the name of dramatization, imitative plays are extensively used in teaching primary reading and history. Pictures of dramatic projects are shown on pages 134, 136, 236, 238, and 240.

Story of the picture on opposite page. — The third-grade children shown in this picture have been studying the early history of Chicago as described on page 137. In this connection they constructed a little play centering around some of the incidents in the life of Chicago's pioneers. In making their play they chose the situations which they desired to use from "The Story of Chicago," devised the necessary action, dictated the dialogue, elected the actors, secured some of the costumes from the school's costume box and made others, practiced the play a few times, and then presented it to the assembled grades at morning exercises as shown in the picture. Such a project may consume the time of the periods for history and language for two or three weeks. Usually a class undertakes only one or two such projects during the year. The picture illustrates vitalizing the study of history and training in problem solving and in oral, written, and dramatic expression. It also illustrates the utilization of children's interests in adventure, communication, imitative or dramatic play, and emulation. The last appears in "trying out" various children for the several characters. It also illustrates provision for individual differences, since a variety of talents are called for, and children who may not succeed well in certain abstract phases of school work may "star" in such a project as that shown in the picture.

The picture illustrates also the matter of schoolrooms and equipment. Notice the small stage with simple, solid-color flies overhead, the screens for walls, the stock fireplace, the spinning wheel from the school museum, and the costumes from the school costume box.

Courtesy of The University of Chicago Elementary School

DRAMATIC INTERESTS OF FOURTH-GRADE CHILDREN UTILIZED IN VITALIZING THE STUDY OF ROMAN HISTORY

See story on opposite page

10. **Interest in games.** *Illustrated by popularity of sporting page.* — The interest in games is another complex of instinctive tendencies which is a striking feature of human nature, not only of children but also of adults. To appreciate this fact one has only to recall the intense interest in baseball, football, tennis, golf, bowling, wrestling, prize-fighting, card-playing, and the sporting page of newspapers. Rich and poor alike are enthusiastic. The interest of the well-to-do and better-educated classes is illustrated by the fact that many of the leading daily papers which cater especially to these classes maintain as one of their principal features especially strong sport departments, including some of the highest-priced writers in the country.

Children's interests in games used to improve drill. — The interest of children in games is proverbial. As in the case of imitative play, kindergartens and primary grades now use

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Story of the picture on opposite page. — The dramatic scene shown in this picture was prepared in the same general manner as described at the bottom of page 237. In this case, however, the fourth-grade children were studying Roman history and constructed their play around the struggles between the Horatii and the Curiatii. The costumes in this case are easily made from cheesecloth, crêpe paper, or other simple materials. Some of them are found in the school's costume box. Some of the practical-minded, adventurous boys of the class, who show very little interest in school, may become keenly interested in making the weapons used in this scene and in taking part in the combats. This interest may be extended to reading the history in order that the weapons and action may be historically accurate. This play was prepared for the spring festival held in the school garden. No effort is made to secure a finished performance or elaborate costuming. After the teachers and children have had a little experience with such performances, they take only a few hours (that is, the history and language periods for two or three weeks) to finish the task, from the study of the historical situation to final presentation before the assembled school.

Courtesy of The University of Chicago Elementary School

SECOND-GRADE DRAMATIC PROJECT IN THE STUDY OF SHEPHERD LIFE

See story on opposite page

games to teach many useful facts and activities. Above the primary grades, games are used chiefly for drill, which, as a consequence, has become the phase of school work in which we often find the most intense interest. If I were asked to name the one feature of school work below the sixth grade in which I have seen pupils most eager and attentive, I should mention pure abstract drill games in arithmetic, absolutely unmotived by any other interest than that of the game. One example was described on page 208. Another example is the following from a second grade. The teacher has written on the board the following combinations to be added:

12	12	12	12	11	12	12	11	11
7	4	9	8	7	3	2	5	9

A guessing game is played as follows: One child thinks of one of the *sums* and says, "I am thinking of a number." Another child runs to the board, takes a pointer, and choosing any combination gives the sum by asking, in case he points at the first one, "Is it 19?" and so on until he picks out the one which the first child had in mind. A skilled teacher with a pack of large printed cards containing numbers, or words, or phonic syllables can stand before a class and conduct with children an educative drill game

Story of the picture on opposite page. — This picture illustrates the same general points in teaching as do those on pages 236 and 238. In this picture second-grade children are shown presenting a little play based on the Arabian story of Tellah in Jennie Hall's "The Weavers and Other Workers." The latter book is read in connection with the study of shepherd life as indicated in the course of study described on page 137. Naturally the whole technique of constructing and presenting the play in the second grade is much simpler than in the case of the third grade described on page 237 or the fourth grade described on page 239. These pictures illustrate the utilization of children's interests in adventure, communication, and imitative play as a means of vitalizing and clarifying their ideas of social activities, and of interesting them in reading.

which equals in zest and interest any baseball game or "Ring-around-a-Rosy" game that children ever enacted themselves, and the drill games have no other practical motive for the children than have these common games.

Summary of discussion of special instinctive interests. — This will conclude our discussion of the special instinctive interests of children which have been used or are being used to keep pupils in a frame of mind favorable to learning. We noticed that fear of physical pain and fear of sarcasm and ridicule have been discarded not only for humanitarian reasons but because they arouse an unfavorable condition of forced divided attention. In place of these we find Rousseau's humanitarian psychological program of child study resulting in the use of the common instinctive interests in adventure, romance, actions of animals and people, social approval, rhythm, rime, jingle and song, puzzles, problems, mental activity, communication, manipulation, physical activity, collecting, imitative play, and games.

Children learn to work effectively through interesting activities. — These active tendencies, strivings, and cravings of children, which we call their interests, are utilized or directed so as to get the worth-while tasks of the school accomplished energetically, effectively, and economically; they are not used merely to pamper the children or to amuse them. Through carrying out the strivings which these interests involve, the children learn to work for more and more remote ends and purposes. For example, they begin reading with stories of their own pets, or stories of other animals. As their vocabulary grows, they attack more and more difficult reading to get the stories contained. They are assisted in mastering and remembering the vocabulary through drill games. As they acquire skill in reading, near the fourth grade, their interest in problems and in communication is utilized to get them to read widely in order to bring pertinent evidence and information to be presented

to the class. In this wide reading, their collecting instinct may be appealed to and result in training in gathering pictures, quotations, and other useful information from many sources. At the end of the training they have become skilled silent readers and more or less expert workers with books. They have been prepared to work effectively through activities, which, in the beginning in the kindergarten and first grade, are predominantly play, but which gradually take on the character of working for more and more remote ends as the pupils progress through the grades.

Pupils, cowboys, artists, executives, etc. may enjoy their work as a game. — Such work, however, at all stages may possess the playful characteristic of being fun in itself, of being intensely interesting at each stage. This is true also of much of the work of the world in which many teachers, writers, artists, speakers, mechanics, cowboys, professional soldiers and sailors, politicians, administrators, managers, and other kinds of workers are carried along, not by a sense of duty, but, to use a common expression, because they "like the game"—they can't give it up. Unfortunately, some workers do not take to their jobs in this spirit, but they are generally recognized as the less fortunate class. Certainly from the standpoint of creating favorable conditions for learning in school, which is the topic of this part of the text, it is much more economical and effective to create for pupils situations in which they attack their work with the same zest and interest as do the great workers of the world who "enjoy the game."

Work of life which involves learning may be intensely interesting. — Another important point to consider in comparing the work of the school with the work of the world is that the latter may be divided into (1) activities in which *new situations* and *new problems* are continually arising, and (2) activities which are repeated with *routine uniformity* from day to day. Many of the workers noted in the

preceding paragraph are engaged largely in the first type of activities, in which the novelty and variety of experiences help to make the work interesting. However, any kind of job or activity may, in the different stages in learning it, illustrate this same contrast between (1) novelty and (2) routine sameness. Thus, cooking may be fascinating to a young housewife when she is learning it, but after she has mastered all the recipes which she can devise or afford, it may become humdrum monotony. Similarly, a stenographer's job may be quite interesting while she is learning the work in a new office, but after she has written and filed the same type of formal material day after day it may become dull and dead. Now, to which of these working situations in life should we compare the work of the school — to the interesting process of learning a new job or to the humdrum routine of a job that is so monotonously the same that it has lost all interest and become drudgery? Obviously, since the school's tasks are predominantly those in which pupils are learning new ideas, meeting new situations and problems, and making new processes automatic, we are justified in comparing its work with the interesting periods of learning in life's work instead of comparing it with life's routine drudgery.

Interest in school work does not mean soft pedagogy; difficulties are interesting. — Finally, it is perfectly clear from the above examples that utilizing pupils' interests in order to direct their energies along educational lines does not imply merely making studies easy for them. To be sure, some of the learning will be easy and all of it will be sufficiently easy so that pupils can understand and master the material in hand. Otherwise the principle of apperception would be violated and their efforts be fruitless and wasted. But much of their interested learning will present difficulties which call forth their best efforts. This is particularly true in the case of the interests in group emulation, problem solving, communication, and collecting, which

are strongly appealed to above the primary grades. Stimulated by these interests, a pupil may work long and hard in solving problems, formulating a composition or collecting specimens, pictures, folders, maps, etc.

Conclusion. — The purpose of this chapter has been to show how the educative and serious tasks of the school can be learned most economically and effectively by utilizing children's active interests. From the illustration of using their *interests in adventure* stories as a means of teaching reading and history economically, we proceeded to the *general points* to be considered in utilizing *any* specific interest. These general aspects were summarized on page 213 and were followed by the evaluation of thirteen instinctive tendencies which have been utilized in schools, from the fear of physical pain to the interest in games. These were summarized on page 242 and followed by an argument to show that school activities based on these apparently playful interests may be very much like those phases of the work of the world which present new problems or situations from day to day in which adaptation or learning is called for. In the next chapter we shall consider types of learning which do not involve new problems or situations so much as they involve memorizing or practice or drill upon processes which are already understood. Even in these cases, however, as has been frequently suggested in the present chapter, we shall see how the zeal and interest of pupils enables teachers to secure, after short periods of drill, results that the old-fashioned schools failed to secure with prolonged periods of uninteresting grind.

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CHAPTER X

DRILL AND PRACTICE

Making Responses Automatic by Repetition

Main points of the chapter. — 1. Examples of drills with vocabulary cards, fraction cards, and printed problem sheets illustrate modern drill methods. With such examples the following rules are developed:

2. Only correct practice makes perfect; therefore,

a. Delay drill until a correct start is assured.

b. Always subordinate speed to accuracy.

3. Avoid wasting time on nonessential and accessory processes.

4. Secure zeal, interest, and concentration of attention with short snappy drills.

5. Use ready-made scientifically organized drill systems.

6. Continue drill until precise standard scores are maintained.

7. Give additional practice in using abstract forms and processes in concrete situations.

Five aspects of learning: self-activity, apperception, preparation, interest, drill. — Up to this point in our story of how children learn most effectively and economically we have noted the following points: A pupil learns through *his own* response and activities; consequently the teacher must be *skilled in inferring* what the mental *response* of each pupil is at any moment and in *understanding the conditions* which determine his responses. Among these conditions we noted the pupil's *past experiences*, upon which the teacher must build, and his *present frame of mind*, which the teacher must modify or prepare in order to secure favorable mental backgrounds or attitudes in the pupils. As most important

among these attitudes we discussed *interests,* which we described as strivings, cravings, or active mental tendencies in the pupil which should be utilized by the teacher. These discussions of learning thus gave us four principles of teaching; namely, those of self-activity, apperception, preparation, interest. In this chapter we shall take up a fifth aspect of learning; namely, how to make permanent and automatic such particular responses as are involved in correct spelling of common words, legible and rapid handwriting, correct and rapid adding, subtracting, multiplying and dividing, and rapid recognition of words and meanings in reading.

Examples of greatly improved technique in drill lessons. — In view of the many recent improvements in the conduct of drill lessons in the above subjects and the definiteness of the skilled teacher's technique, we shall describe sample drill lessons in reading and arithmetic as an introduction to the principles to be observed in lessons involving drill or practice. The first of these lessons illustrates the use of drill cards in teaching reading.

Six tricks in first-grade drills with vocabulary cards. — A first-grade teacher, in about the seventh week of school, had taught the children to read a chart containing such sentences as the following:

We have two pets.
They are white mice, etc.

These sentences had been used by the children in telling about their two mice. At the present time we are interested in part of the drill which followed the reading of the chart as a whole.

At the beginning of the reading lesson the next day the teacher had arranged on the blackboard ledge eight stiff cards, on each of which was printed one of the words learned recently; namely, "mice," "white," "have," etc. The pupils were seated in little chairs at the front of the room. The lesson proceeded as follows:

1. The teacher gathered the cards and, holding them so that the class could see, said, "Here we have some of our old words. Let 's see if we can name them." She then displayed one card after the other. The class, whispering, named the words in concert.

2. The class then stood up. The teacher handed a child a card. If he named the word successfully, he sat down, keeping the card and holding it so that the word could be seen from the front of the room.

3. After all the cards were given out, each of the children that still remained standing was permitted to pick, from those sitting, a card containing a word which he could name correctly and then to be seated. Finally all were seated.

4. The teacher then said, "I want the card which says 'mice.'" The child having it ran quickly and gave it to the teacher. This was repeated until she had all the cards.

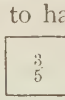
5. The cards were then redistributed among the children by the teacher and called for again as in paragraph 4. As attention was beginning to flag slightly, the teacher said, "I think some of the children are sleepy"; whereupon these children sat up and paid attention.

6. The teacher then placed the cards in a row on the blackboard ledge, the children reading them quietly in concert as each was placed.

7. The drill was then concluded with the following game: A chosen child ran into the cloak room. Another child ran quickly and pointed at a word, for example, "mice," then returned to his seat. The child in the cloak room returned. He pointed at a word, for example, "have," and said, "Is it 'have'?" The children replied in concert, "No." He continued to point at and name words until he said, "Is it 'mice'?" Whereupon all the children clapped their hands, and he returned to his seat. The game was then repeated once.

Eight words, six tricks, six minutes, ten repetitions at intervals and with attention, application. — After the class

was seated and ready for the above drill, the total amount of time consumed by it was about six minutes. In this brief time six different tricks, stunts, or devices were used. The necessity for this variety is shown by the fact that the attention of the little six-year-olds began to flag after the fifth step in the drill. The teacher, consequently, proceeded quickly to the seventh step, which involved more physical activity for some and more interesting activity for all; namely, watching to see if the child guessed the right word and clapping their hands when he did. By these devices, each word was attentively observed by most of the children at least ten times. The observations of each word were not consecutive however, the attention having been drawn to other words in the intervals which elapsed between the observations of any given word. After the drill had concluded with the game which provided for physical activity, the reading lesson was continued by reading on the chart the story of their pets, in which the words of the drill occurred in sentences.

Eleven points of technique in fifth-grade drill with fraction cards. — Another example of modern drill methods which illustrates the fine technique that a teacher has to develop in using drill cards is found in the game with fraction cards described on page 208. The fifth-grade teacher referred to had a pack of cards containing fractions such as  . In carrying on the drill game in multiplying these, each of the following numbered points represents a distinct item in her technique.

1. She stood before the class in such a position that the light fell on the cards so all the pupils could see well and none face a window.

2. She appointed one boy to time the game.

3. She wrote the multiplier, for example, $\frac{1}{2}$, on the blackboard behind her.

4. She made sure that all children understood what they were to do.

5. She then said, "Ready, go!"

6. She flashed the first card, for example, $\frac{2}{9}$, by bringing it from the back of the pack to the front. The first child gave the answer as quickly as he could say it.

7. (*a*) If his answer was correct, she flashed the next card to the front of the pack. (*b*) If his answer was incorrect, the next child gave the answer, the card was dropped on the desk for future use, and the next card flashed.

8. This process continued around the class until the whole pack of cards was used.

9. She then picked up from the desk the cards to which incorrect answers had been given, and flashed them again, calling on the pupils who had missed them if she could remember without hesitation who they were.

10. She then asked the timekeeper for the time consumed and wrote it on the board, for example, "3 min. 30 sec.," under the record of the previous day for the same pack of cards, and opposite the record of "3 min. 25 sec." made by another group of children.

11. She concluded with remarks intended to arouse interest in improving the record until it equaled a standard score, such as three minutes for this pack.

Six minutes, fifty problems, zeal and attention, application. — The total amount of time consumed in this drill in getting the class ready, flashing the cards, writing the record on the board, and making remarks about it was about six minutes. During this period nearly every child in the group of twenty-two was called on three times, and the total number of problems correctly worked was about fifty. Practically every child was attentive to each of these because of the intense interest in improving the score. After this drill, problems of areas, requiring the use of fractions in square measure, were assigned.

From group practice to individual practice. — Both of the examples of drill method given above illustrate group recitations in which the whole class gives attention to a common center. We shall now give two examples in which the children work as individuals.

Addition combinations to 9 + 9 to be said in thirty seconds. — Our first example of individual drill occurs in the third grade where children memorize for rapid oral reproduction all the forty-five addition combinations up to 9 + 9. These are all printed or mimeographed on a sheet of paper, in mixed order, making five rows similar to the following:

5	7	3	9	8	4	6	7	2
2	4	6	7	1	3	9	1	3

A copy of the sheet is given to each child after the teacher is sure that the combinations are generally understood. The technique in this case is also somewhat complex. The ultimate achievement expected of each child is ability to give orally the *answers* to all the combinations in any order on the chart, up or down, from left to right or right to left, in thirty seconds. Every day some children are given trials and their records kept; for example, a child may in the beginning require forty-five seconds, decrease rapidly in a few days to thirty-seven seconds, but not reach the desired goal of thirty seconds for many days. Practice is given by concert drills and individual drills in school, and the children are urged to repeat the answers to someone at home who will time them and correct them.

Systematic and thorough; saves time from useless responses; analyzes and corrects wrong inner responses. — The outcome of the device is automatic skill in using rapidly these combinations in problems involving addition. The device is systematic and thorough in achieving this end, since it gives drill on all these combinations. It saves time in many ways. For example, it eliminates the time consumed in the old-fashioned drills by the teacher's saying,

"What is 9 and 6, Johnny?" and waiting for Johnny to wake up and reply. It saves Johnny the time of saying "9 and 6 are." He merely says "fifteen" as quickly as he can when he sees $\begin{array}{r} 9 \\ 6 \\ \hline \end{array}$ on the paper. Moreover, in Johnny's after life it saves him from saying "9 and 6" thousands of times; instead, when he encounters $\begin{array}{r} 9 \\ 6 \end{array}$ in an addition problem he merely thinks "fifteen," just as he thinks "cat" when he sees the word, instead of thinking "c-a-t." In order to make sure that each child does read off each answer in this automatic way, without going through some roundabout process, the teacher has to make a careful study of the children who are slow in learning to repeat the combinations in the desired time. For example, one such child was found who, when adding $\begin{array}{r} 9 \\ 7 \\ \hline \end{array}$, instead of merely recalling the answer, 16, thought of it as follows: $9 + 2 + 2 + 2 + 1 = 16$. The teacher had to break up this habit and get the child to think automatically $\begin{array}{r} 9 \\ 7 \\ \hline 16 \end{array}$.

Printed sheets of problems for fundamental processes; timed tests, individual practice, self-correction, individual advancement. — The second example of individual drills is an elaborate extension of the above type of device to the working of all kinds of problems in adding, subtracting, multiplying, and dividing; the problems being printed on sheets or cards ready to be distributed to the pupils. For example, each pupil may be given a sheet or card printed full of such problems in addition as the following:

6	4	3
5	8	7
1	2	6

All he has to do is to write the answers as rapidly as he can on transparent paper or through holes which are perforated in the problem card. He does not begin to write until the teacher gives the signal for the whole class to begin. At the end of seven minutes the signal may be given to stop. All pupils then cease work. They may turn the problem cards over to compare their answers with the correct ones, which may be printed on the back of the cards, or they may use some other device for self-correction. Each pupil makes a record of the number of problems which he has right. If he has completed all the problems correctly, in the allotted time, he is given a different card of problems to work next time. The children who do not have satisfactory scores on the first card may practice on it during study periods until the next timed test on it is given, when they are tested on it again, at the same time that other pupils are tested on the lessons to which they have progressed.

Elaborate systems organized by authors and publishers; elaborate routine instituted by teacher. — It is obvious that this scheme which provides many sheets of printed problems and permits different pupils to progress at different rates and work with different sheets is much more elaborate than the other examples of drill devices which we described. It involves, in the first place, elaborate printed materials, — printed sheets or cards of problems which have been carefully devised so as to give drill on all combinations and operations. This, however, is not a task that confronts the teacher, as it has already been performed by the authors and textbook companies. The teacher's task is to accustom herself and the pupils to the routine which is completely described in the teacher's manual that accompanies the drill materials. As indicated in the chapter on economy in classroom management, however, this need present no special difficulties, since the most elaborate routine can easily be taught to children if the teacher will take the trouble. This

type of drill exercise calls, however, not only for elaborate routine organization but also for careful attention to the individual needs of pupils. Thus it saves much time in two ways: first, by having printed problems at hand, so that pupils spend most of their time in *arithmetical thinking* instead of fooling it away in copying problems; and, second, by permitting pupils to cease drill on processes which they have already made perfectly automatic and to spend their time on other assignments.

Examples introduce to principles of drill. — The four examples of modern drill methods which we have described — namely, first-grade drill with vocabulary cards in reading, fifth-grade drill with fraction cards, third-grade oral drill with a chart of addition combinations, and systematic written drill in the middle grades with ready-made printed sheets of problems — serve to familiarize us sufficiently with concrete schoolroom drill situations to enable us to understand easily the general principles of teaching to be followed in organizing effective drill lessons. These principles we shall now consider systematically.

1. **Only correct practice makes perfect.** — Our first principle of drill is that "only correct practice makes perfect"; therefore "make haste slowly" and try to make sure that children are making the correct inner responses in their practice. This principle may be formulated in two rules: namely,

a. Repetitions should be delayed until a correct start is assured.

b. Always subordinate speed to accuracy.

These rules may be explained as follows:

a. Correct start should precede repetitions. — In our chapter on apperception we gave examples of the observation and violation of the rule concerning a correct start. One example concerned the children who could recite a rigmarole of number names but could not count objects. They had

memorized meaningless words but had not had the correct initial experience of actually counting and of associating the number names with real quantities. In our account of the first-grade drill lesson in reading, in the present chapter, we indicated that the teacher had made the correct start in preceding lessons by having children read sentences which expressed their ideas about their pets. Only after these sentences were understood and the words in them identified was the abstract drill given with the same words on cards. Similarly, we could show how the fraction drill had been preceded by many carefully conducted lessons, in which the processes of multiplying fractions had been made clear to the pupils. Finally, in the complicated written practice in adding, subtracting, multiplying, and dividing, described above, the correct start is thorough knowledge of the fundamental combinations and operations, of addition combinations and operations, etc. Unless a pupil understands these elementary combinations and operations he cannot make effective progress with complex problems involving them.

b. Subordinate speed to accuracy. — The rule concerning subordinating speed to accuracy is particularly important in arithmetic and handwriting, where both factors are greatly emphasized at the present time. Until recently speed was often neglected in both arithmetic and handwriting, but examination of the use of these subjects in life shows that pupils need to be trained to cipher and write not only *correctly* but also at *fair speed*. As a consequence, speed is now an aim in all drills, as illustrated in the limit of thirty seconds set for third-grade children with the addition combinations up to $9 + 9$, and the careful timing in the fraction drill described above. These speed goals or time goals assist in teaching in two ways: *first*, they set certain *definite, precise standards* for the teacher and pupils to strive for, and, *second*, they *interest* and stimulate the pupils. But in striving to attain speed without careful regard to accuracy,

unfortunate consequences may follow. In the *first place* the responses of the pupils may be *incorrect* — in arithmetic the answers being wrong and in handwriting the letters being illegible. In the *second place* very *unfavorable nervous mental conditions* are brought about in many children. Hence we find the author of one of the well-known practice systems in arithmetic saying,

> The surest sign of faulty use of the practice tests is the speed that is due to excessive effort and nervous strain. The speed that is desired is the perfection of execution produced by thoroughness of preparation. The speed that is merely hurry makes for exhaustion. Do not force speed. Inspire conscientious practice and the question of speed will take care of itself. (**5** (*d*): 4)

2. **Do not waste time on nonessential or accessory processes.** — Perhaps the most striking feature of the improved technique in modern drill lessons is the amount of time saved by eliminating unnecessary movements and processes. A simple illustration occurred in the first-grade reading drill with cards, in which the seating of the children in little chairs in two compact semicircles around the teacher, near the blackboard ledge, enabled the teacher quickly to hand a card to each child and enabled the children to exchange cards and run up to the blackboard ledge with little waste of time. Similarly, saving time was clearly illustrated in the fraction-card drill, in the third-grade addition drill, and in the drills with printed practice problems described above. With the fraction-drill cards, fifty fraction problems could be worked in a few minutes by all pupils, because the teacher *did not* have to state the problem, or call a pupil by name, and the pupil had nothing to do but (1) keep in mind the multiplier written on the board, (2) take in at a glance the fraction on the flashed card, (3) think the answer, (4) speak the answer. The first three of these processes of the pupil constitute the essential arithmetical thinking

processes in which we want to give him training. Everything else, such as getting the problems ready, stating them to the class, and calling on pupils, is accessory. The more we can simplify these accessory processes, the greater the time available for arithmetical thinking.

3. **Arouse zeal, interest, and concentration of attention.** — The general importance of zeal and interest as the basis of economy in learning was emphasized in the preceding chapter. There the special value of the interest in competitive games in drills was illustrated on page 208 as well as in the examples at the beginning of the present chapter. The use of several other instinctive interests, particularly the interests in guessing games, in physical activity, and in novelty or variety, was illustrated in the first-grade reading lesson described at the beginning of the present chapter.

Variety particularly important for small children. — The necessity of variety in the drills for little children is particularly noteworthy. As indicated in the account of the reading drill, the attention of the six-year-old children began to flag after the drill had continued for a very few minutes and the teacher had to conclude with the guessing game, which provided more physical activity as well as a more interesting common center of attention for all the group. As the children grow older their attention may be sustained for a longer period. For example, the actual game in the fifth-grade drill with the fraction cards consumed $3\frac{1}{2}$ minutes, while the whole process took about six minutes. Even with children of this age, however, the teacher did not repeat the game that day, but proceeded to assign area problems in which the fractions would be used.

Snappy, interesting, ten-minute drills have proved adequate. — These examples are fair illustrations of the current practice of having snappy, interesting, abstract drills for a few minutes at the beginning of the lesson, to be followed by content work involving new ideas or application of the

processes which had been drilled on. As Courtis says concerning the fundamental operations in arithmetic,

> Ten minutes a day, day after day, spent in intense, purposeful, snappy practice has proved adequate to develop proper habits of speed and accuracy. Why use more? (**5** (*d*): 3)

Proved by scientific, precise, objective measurements. — When Courtis says "has proved adequate," he means "proved" by means of precise, objective, scientific measurements of the results of actually using carefully organized drill systems in arithmetic. Those who are interested in examining the accounts of such scientific investigations of drill in arithmetic, spelling, and handwriting should read the references given at the end of this chapter. Such scientific investigations make it unnecessary to rely merely on someone's opinions concerning the value of snappy, interesting drill as compared with the old-fashioned ineffective drills, which were characterized often by dallying and disgust on the part of most pupils.

Summary of principles of drill to this point. — The three principles of drill which we have considered thus far include some of the most fundamental practical rules that a beginning teacher can easily keep in mind in organizing drill activities. They may be summarized as follows:

1. Only correct practice makes perfect; therefore,

a. Delay drill until a correct start is assured.

b. Always subordinate speed to accuracy.

2. Avoid wasting time on nonessential and accessory processes.

3. Secure zeal, interest, and concentration of attention with short snappy drills.

To these fundamental elementary rules we may add the following rules or principles for further guidance.

4. **Use ready-made, scientifically organized systems.** — The content of the drills in spelling, arithmetic, handwriting,

and reading consists of thousands of words, number combinations, and letter forms which are of practical value in everyday life. It is a stupendous task to determine

(1) which of these forms are most valuable;
(2) which can be learned readily by children of different ages;
(3) what special difficulties are encountered with various forms and combinations; and
(4) upon what days and for how many days each class and each pupil needs to be drilled on each form or combination.

Illustrated in scientific investigation and organization of spelling vocabulary. — In our discussion of the relative values of subject matter, we described (page 104) the scientific work that had been done in determining the 4000 words which are in most common use in everyday writing, the hundred "spelling demons," or most difficult words, and the organization of spelling textbooks which distribute these words systematically through the grades with proper reviews and repetitions to secure permanent learning of them. This accomplishment represented the cumulative results of thousands of hours of scientific study and practical organization of spelling material. It is obvious that any teacher profits enormously from using in her spelling drill a ready-made system which is the outcome of so many hours of reliable work by others.

Thousands of hours used to devise scientific drill systems in arithmetic. — In arithmetic a similar situation prevails. In our chapter on the selection of subject matter (page 104) we showed that it had been determined that simple problems involving simple operations in adding, subtracting, multiplying, and dividing constitute the chief arithmetical activities of life. A systematic study of these processes enables one to list all of the number combinations and operations which are used. A study of the ease and difficulty with which children carry on these various operations reveals

then the "arithmetical demons," or steps of special difficulty, as well as the minor difficulties which they encounter. Upon this basis a thorough systematic drill system in arithmetic may be worked out, printed upon sheets, and made available for all teachers. Thousands of hours *have* been spent by men of scientific ability, coöperating with teachers all over the country, in devising and revising such arithmetical drill systems. They are now for sale by publishers. If a teacher is at work in a school which, unfortunately, does not provide her with such ready-made drill systems for use in her classes, it would pay her to secure sample copies of them in order to derive many suggestions for improving her drill lessons. For a list of some of these ready-made systems see the bibliography at the end of this chapter.

5. **Continue drill until precise standard scores are maintained.** — The scientific drill systems described above enable us to answer a very perplexing question; namely, When has sufficient drill been given on any combination or operation in reading, handwriting, or arithmetic? This question is puzzling for two reasons. In the first place, a child may be able to read or write or cipher *satisfactorily* at a *slow speed* but make *mistakes* at a *higher speed*. We can increase his speed by well-organized practice or drill, but we need to know when it has reached a sufficient rate. The question is answered by the scientific drill systems by giving standard scores. For example, the class which was multiplying a certain pack of fraction cards described above would not have sufficient skill until it could finish the pack in three minutes; or, in the case of the arithmetic practice sheets described on page 253, a fifth-grade child who is practicing with the lesson sheets is not permitted to leave each until he can complete correctly all the problems on it in a timed test of seven minutes. These standard scores which the children are expected to attain in any grade have been determined by careful investigations of the scores made

by thousands of children in each grade when they have been given various kinds and amounts of training. The scores which they are to attain upon graduation from the eighth grade have been determined by reliable tests of adults who use in daily life the operations or combinations which are to be practiced.

Persistence of skill determined by standard tests. — The second puzzling feature of the question of when has sufficient drill been given is the fact that a child may reach a satisfactory score in handwriting or arithmetic to-day, but fall below it next week or next year. The standard drill systems take care of this difficulty by testing the children frequently, several times each year, and determining from their scores just how much drill they need. It is usually found that *some* children need practice regularly throughout the grades in order to keep them up to standard scores in handwriting and the fundamental operations in arithmetic, but *other* children retain their skill so permanently, or regain it so quickly, that they may be excused from much of the practice that is necessary for many of the children. This fact will be referred to again in a later chapter on individual differences.

6. **Give practice in using abstract forms and processes in concrete situations.** — Finally, we may emphasize the importance of giving pupils practice in using in concrete, complex situations the abstract forms and operations which they have practiced in isolation in the abstract drills. This process was illustrated in the examples with which this chapter opened, where, in the reading lesson, after the card drill, the children proceeded to read sentences containing the words of the drill, and after the fraction drill the children used multiplication of fractions in solving area problems. One of the simplest examples of the need of such concrete practice is found in the case of spelling, in which a child *may* spell a *new difficult* word correctly when it occurs in a column test but spell it incorrectly when writing it in a sentence.

Such failures are illustrated in the following experiment by Tidyman and Brown. (**6**)

A sixth-grade class containing 41 pupils was taught the spelling of 37 new words, 20 of these being rated as easy and 17 as difficult. " The method of teaching consisted of the study of the individual words from the board, use in oral sentences, oral spelling, and writing," *but the words were not written in sentences during the training.*

After some weeks, tests were given which included all the new words in column spelling as well as all of them in dictated sentences. The amount of correct spelling of the new words in the sentence test was only 89 per cent of the amount of correct spelling in the column test with the same words; that is, there was a loss of 11 per cent when the words were written in sentences.

Large amount of skill transferred, but must correct amount lost. — We must not be confused, however, by the above results and conclude that training in column spelling is a waste of time. The fact that the correct spelling in the sentences was 89 per cent as great as in the columns is probably more impressive than the loss of 11 per cent. It shows that spelling words may be learned in isolation and then correctly used in sentence writing, with very small loss. However, since our purpose is to secure *absolute correctness in sentence spelling*, we should not overlook this small loss, but take steps to correct it by giving practice in writing the words in sentences in addition to the spelling of the words in isolation.

Rules for conduct of drills briefly phrased. — The above pages present the fundamental principles and rules to be observed in conducting drill lessons. They may be phrased briefly in the following words:

1. Only correct practice makes perfect.

a. Make a correct start.

b. Subordinate speed to accuracy.

2. Avoid unnecessary processes.
3. Arouse zeal and interest.
4. Use ready-made scientific drill systems.
5. Drill till standard scores are maintained.
6. Apply abstract forms in concrete situations.

Is incidental drill as good as socially valuable, interesting, scientifically organized specific drill? — It is generally admitted at the present time that such specific and scientifically organized drill is desirable and necessary in schools. There are a few educators, however, who think that the necessary skill in reading, handwriting, spelling, and arithmetic can be acquired incidentally during the study of history, geography, literature, manual training, etc. They do not believe in abstract drills upon forms, combinations, and processes in isolation from concrete, complex situations. A great deal of discussion has centered in this question of specific drill versus incidental drill. Three aspects of the question have been disposed of in our earlier discussions and may be summarized as follows:

First. The *social necessity and value of these forms of skill* have been shown by precise, objective studies of social activities in the world at large. These studies determine just what spelling words and arithmetical processes and degrees of speed and accuracy in handwriting are desirable. The studies of spelling and arithmetic were summarized in our chapter on the selection of subject matter (pages 103–106).

Second. Children manifest the most *intense interest in abstract drills* which are so organized as to appeal to their instinctive interests in games and emulation, without recourse to any other motive. This was discussed in our chapter on interests (pages 208 and 239–242).

Third. *Ten minutes a day* of such socially valuable, interesting, well-organized drills have *proved sufficient* in each subject to maintain high degrees of skill, most of which transfers to concrete situations.

Our discussions, therefore, have proved that the abstract processes practiced in scientifically organized isolated drills are socially valuable, that the children may take intense interest in such drills, and that the latter are effective in giving children a command of these abstract tools for use in concrete, complex situations.

Inadequacy of incidental practice shown by measured results. — It remains for us to determine whether incidental drill, without the specific abstract isolated drill, is equally effective. Scientific tests indicate that it is not, that where children are not given specific drills, their skill in spelling, handwriting, and arithmetic falls far below that which has been shown to be socially desirable and which they can easily attain through specific drill. The Elementary School of The University of Chicago furnishes interesting evidence of these facts, since, up to about 1909, it was conducted largely on the basis of incidental drills, and after that date specific drills were emphasized. The inadequacy of the incidental drill came to light about 1908, when Stone measured with carefully devised tests the efficiency in arithmetic shown by sixth-grade children in twenty-six school systems, including The University of Chicago Elementary School. The latter took very low rank; in fact so unsatisfactory was its showing that its faculty became very much concerned to improve its efficiency in arithmetic by instituting specific drill in arithmetic. As a consequence specific standardized drill in this subject is now emphasized in the school.

Similar results came to light in the handwriting. This was tested by Professor Freeman in 1912 and found to rank well below that of a good public-school system. Ten minutes a day of specific drill in handwriting was then introduced and the amount of improvement measured after several months with favorable results.

Such scientific measurements show the results of incidental practice in arithmetic and handwriting in an unusually

well-equipped school, with high-salaried, experienced teachers. Even with such favorable conditions, the children did not learn to cipher or write with sufficient skill to meet the standard requirements of daily life as determined by precise investigations.

Deterioration in handwriting without drill illustrated by an example. — The amount of deterioration in a formal skill, such as handwriting, which may result when no specific drill is given in it, especially when it is much used, is illustrated by the following example.

My ten-year-old son attends The University of Chicago Elementary School mentioned above, which still retains the rich course of study in history, geography, nature study, literature, etc. which it formerly maintained, plus specific drill in the formal subjects. By the end of the third grade he wrote a fair, legible hand. He was then out of school for three winter months while we were in Florida. We taught him at home, but neglected his handwriting. After he reëntered school in the spring, the handwriting drills, for a certain reason, were omitted. Then followed the long summer vacation, during which he did much fluent writing; for example, pretending he was writing a book, he copied all of the marginal headings in Marshall's "History of France." In the fall, upon returning to school, his handwriting was so poor that when asked to read one of his compositions to the class, *he could not read his own writing.* It took several months of short drills in school, supplemented by practice at home, to get his handwriting back to fairly satisfactory form.

Specific drill especially needed with rich, enticing course of study. — While a single example, like the above, does not prove our point, it illustrates perhaps more vividly than do the scientific measurements by Stone and Freeman the necessity of careful attention to specific drills in fundamental formal processes. This is especially true in a school that has

a rich course of study in the content subjects, a course so rich and enticing that the formal processes may suffer serious neglect and the pupils be seriously handicapped through inability to use the formal tools of arithmetic and handwriting. This neglect results from the teacher's becoming absorbed in large interesting projects with the pupils, so interesting to *her* that she does not care to devote her time to organizing routine drills. The *teacher's* lack of interest in this part of her work should not confuse us in thinking of the *pupils'* interest. The interest of the pupils, as we have repeatedly stated, may be just as keen in well-organized specific drills as in the richest, meaningful content work, on the one hand, or in the meaningless playing with jacks, jumping a rope, singing "Ring-around-a-Rosy," wrestling and playing Black Tom or baseball, on the other hand. Naturally, the adult teacher *may* not care to organize drills any more than she cares for these childish games, but she should not let *her* lack of interest in these matters blind her to the needs and interests of the children.

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New York, concerning the Courtis Practice Materials in Arithmetic. See also the following arithmetics for examples of well-organized drill materials incorporated in the textbook: CHADSEY-SMITH. *Efficiency Arithmetics.* (Atkinson, Mentzer, and Company, 1917.) WENTWORTH-SMITH. *Essentials of Arithmetic.* (Ginn and Company, 1915.) Most of the systems of teaching primary reading provide ready-made drill materials.

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CHAPTER XI

ADAPTING CLASS INSTRUCTION TO DIFFERENCES IN CAPACITY

Main points of the chapter. — 1. Monotones and sweet singers in the same family illustrate differences in the ease or difficulty with which different children learn.

2. Drill exercises in arithmetic which permit each pupil to advance at his own rate illustrate adapting class teaching to the needs and capacities of different children.

3. Carefully organized supplementary assignments for bright pupils enable them to utilize their spare time profitably.

4. Individual promotions of pupils who have failed, but who can progress with individual teaching through the grades, illustrate *administrative* provisions for individual attention.

5. Statistical studies show that without differentiated teaching the brightest pupils may have half their time to spare while the slowest are dragged along so fast that they cannot learn.

6. Such studies show also that there are only a few such bright and slow pupils in an ordinary class.

7. Precise objective studies of the mentally deficient, of geniuses, and of twins show that inborn equipment is a very large factor in determining an individual's rate of learning.

8. There is such a variety of human talents, however, varying from the manual skill of the artisan to the scientific reasoning of a Newton or the statesmanship of a Lincoln, that practically every pupil has some talent that is worth developing to a high degree.

9. Certain capacities, such as arithmetical computation, should be developed in all pupils to a certain minimum skill desirable for social usefulness.

10. In all cases the inborn character of varied talents calls for the most sympathetic, reasonable, differentiated treatment of pupils by the teacher.

The last of chapters on general aspects of learning. — This will be our last chapter on the *general* aspects of learning processes. If we go back to the first of these chapters, we shall find that it emphasized the fact that a pupil learns through his own responses; hence the response that a pupil makes in any process of learning becomes the central factor for the teacher to consider. In the other chapters on learning we noted how these responses were influenced by the pupil's past experience and present frame, including, in the latter, attitudes of attention and interest. Finally, we described how certain responses in the formal subjects are made automatic through correct, interesting practice. In this connection we noted that certain standard scores in arithmetic, handwriting, etc. had been established and that pupils vary in the ease with which they reach and maintain these scores. Some children reach and maintain them with little practice, and in a well-organized drill scheme are then excused from further practice. Other children, however, have great difficulty in reaching the standard scores; they need much more individual assistance from the teacher and many more periods of practice. Such facts concerning the *individual differences* in the ease with which pupils learn will furnish the material for discussion in this chapter.

Example of individual differences. Great differences in capacity for learning to sing. — One of the simplest examples of variations in the ease with which children learn is found in learning to sing. Some children learn to sing correctly with practically no instruction, merely through imitation, while others, even with the regular school instruction in singing, remain monotones or near-monotones. Very often when these differences in the capacity to learn to sing are mentioned to singing teachers, however, they tend to belittle the differences by affirming that "even the monotones can be taught to sing if given sufficient individual teaching." They will cite examples of certain extreme monotones who

have learned to sing a few songs through very skilled prolonged teaching. However, instead of *minimizing* the importance of individual differences in the capacity for learning to sing, such examples merely *emphasize* the great influence and importance of such differences.

Illustrated by children from same family. — Another objection that is often cited in an effort to refute the importance of such differences in capacity is the statement that "the monotones had unfavorable home influences" and that "the teaching did not begin at a sufficiently early age." In order to secure evidence concerning these statements it is merely necessary to make observations in families where both monotones and singers exist among the children of the same family. The following is a typical example from a family which I have been observing for some years.

Monotones and sweet singers in the same family. — Two of the children in this family, a girl of six and a girl of ten, are radically opposite in singing ability. The six-year-old is a sweet singer; that is, without instruction she easily picks up songs, and sings happily and correctly at her play much of the time. The ten-year-old, on the other hand, is a near-monotone; that is, she learns songs with great difficulty even under instruction and seldom sings one through correctly.

Same opportunities. — Both of the children have had the same home and school influences as far as their ages permit, the monotone, being the older, having had more musical opportunities. They have both heard piano and phonograph music in the home and, as they grew old enough, had the common singing experiences of the Sunday school, kindergarten, and primary grades. The monotone has been taking piano lessons for two years.

Parental differences. — The same differences as are found between these children appear between the parents.

Musical mother. — The mother has very fine musical perception. She has always whistled and sung for fun, can easily

sing any part in chorus singing, remembers a song when she has heard it only a few times, and can play it "by ear" on the piano with proper improvising of accompaniment.

Father, grandmother, and great-grandmother were monotones. — The father, on the other hand, is a monotone. Like his monotone daughter, he has great difficulty in singing songs correctly. His mother was a monotone, and his mother's mother was a monotone.

Father's stepmother a musician. — The father's mother, however, died when he was a baby, and, at the age of two, he acquired a stepmother who was a musician, — pianist and singer. Unlike the stepmother of the storybooks, she was very kind to the boy, who liked her very much. Moreover, she brought much music into the home, but the little boy failed to learn to sing more than a few airs. However, he now remembers fairly well a few songs which he learned in his teens, such as, "Hail, Hail, the Gang 's all here" and "Two little Girls in Blue."

Father ranks high in most other capacities. — The father's lack of capacity for singing is highly specialized. In almost every other capacity he takes high rank, being an efficient business man, executive and public speaker, and an expert in bowling, tennis, golf, and rifle shooting.

General facts about individual differences suggested by the example. — This little family story of individual differences in the capacity for learning to sing suggests a number of general facts about individual differences in capacities as follows:

1. The differences may be inborn or native, not merely due to education. In this case the evidence indicates rather conclusively that they are inherited.

2. With the same opportunities, children with different native capacities may learn very differently, achieve very different degrees of skill. The amount of teaching that is needed to teach one child to sing only one song indifferently might suffice to teach another child to sing ten songs well.

3. However, a person who possesses only a very small native capacity for a certain activity may still acquire some skill in that line if given sufficient practice, as shown by the father's learning a few songs.

4. The specific skill acquired from such teaching may persist a long time, as shown by the father's ability to sing a few songs which he learned in adolescence.

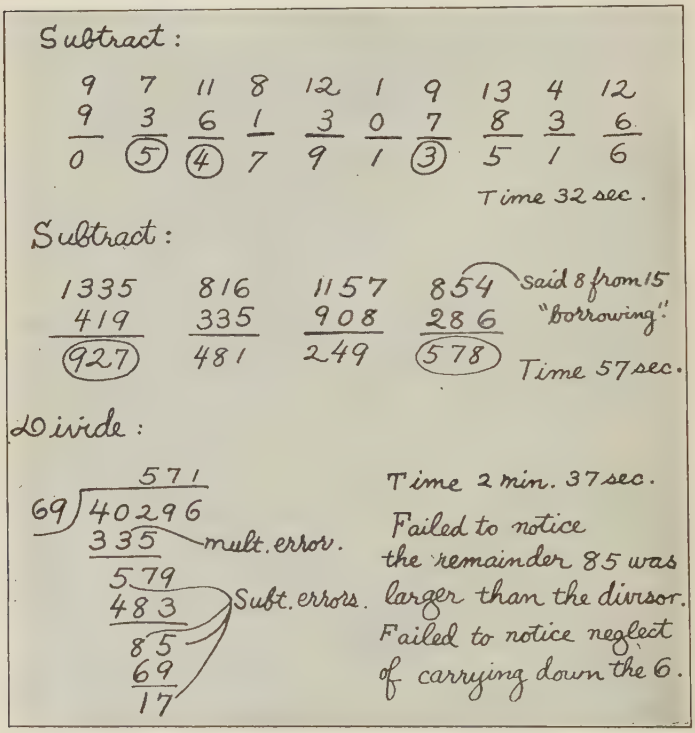
5. A lack of capacity may be specialized, so that a person who cannot learn easily in some line may easily become an expert in others.

Weak or slow pupils. *Monotones not denied promotion.* — Let us now turn to the school and find what is done about monotones in the singing classes. In the first place we find that lack of ability to sing correctly is never made a basis of promotion or nonpromotion in the ordinary school. Probably the reason for this is recognition of the fact that a person may be unable to sing and still be a very useful and happy member of society; for example, the father mentioned above, while he cannot sing, is a very efficient and useful person and also has much fun through participation in many sports and through wide reading.

Placed near piano or excused from singing. — In the singing classes in school the monotones are often placed near the piano or near the teacher in recognition of their peculiar needs. It would probably be wise to excuse the most extreme cases from the singing classes altogether, for two reasons; first, in order that they might spend their own time in a more profitable manner, and, second, in order to avoid handicapping the children of moderate musical capacity who cannot sing correctly when seated near a monotone.

Contrast with required skill in fundamentals in reading, writing, and arithmetic; these socially necessary. — Let us now compare the treatment of monotones in school with the provisions for individual differences in drill lessons in reading, handwriting, and arithmetic. A very strong

contrast appears, owing to the difference in the social utility of the activities in question. As indicated above, a person may be very useful, efficient, and happy and not be able to



TEST PAPER ILLUSTRATING DIAGNOSIS OF INDIVIDUAL PUPIL'S DIFFICULTIES

From an investigation by J. H. Smith described on page 275

sing. But a person who cannot read, write, or cipher at fair speed and with fair accuracy has his chances for usefulness and efficiency very much curtailed in modern society.

Much individual attention given in these fundamentals.— Consequently, as we indicated in the chapter on drill, we

find the most careful attention being given to individual pupils who have difficulty in attaining the standard scores in reading, writing, and arithmetic that are socially desirable. With skilled diagnosis of each pupil's difficulties, skilled analysis of his internal responses, and skilled suggestions for improvement, many of the slow pupils can acquire the desired skill.

Examples of individual diagnosis and assistance. — In our chapter on drill (page 253) we gave one example of the child who had difficulty in adding $\begin{matrix} 9 \\ 7 \end{matrix}$ because he had to stop and work it out as $9 + 2 + 2 + 2 + 1 = 16$. The teacher discovered the child's difficulty with this particular combination and practiced him until he thought 16 automatically when he saw $\begin{matrix} 9 \\ 7 \end{matrix}$ to be added.

Another example is described by J. H. Smith, who, in teaching arithmetic in the upper grades of The University of Chicago Elementary School, carried on tests of individual pupils to determine their special difficulties, and then remedied these by appropriate individual training.

The children were tested individually with printed sheets of problems. Each pupil was asked to think "out loud" while doing his written work on the test problems so that the teacher could find the errors in his inner responses. The teacher made note of these errors and later entered memoranda of them on the pupil's test paper. A sample of a pupil's paper with memoranda entered by the teacher is shown on page 274. In commenting on the individual needs of the pupil who wrote this sample paper, Smith says:

This individual test showed the pupil to be very weak in subtraction. Note that he missed 3 out of the 10 easy subtractions at the beginning of the test. The example in long division showed an incomplete understanding of that process, but even if he had understood the division process, he would have been unable to

work the example correctly on account of making so many errors in the subordinate processes of multiplication and subtraction. (**12**: 196)

Similar diagnostic tests in the cases of pupils who were having difficulty with reading are described in references (**14**) and (**15**) in the bibliography at the end of this chapter.

Special difficulties due (1) *to inborn incapacity or* (2) *to absence, inattention, poor teaching.* — A pupil's special difficulties which appear in such diagnostic tests in arithmetic and reading may be due (1) to an inborn lack of capacity for arithmetical computation or reading, or (2) they may be due to absence, or inattention, or poor teaching of the processes with which the child has difficulty. In the second case skilled individual assistance may enable the child to forge ahead rapidly after the special difficulty has been cleared up. In the first case, where the difficulty is due to inborn incapacity, prolonged patient individual assistance by the teacher may be necessary to make automatic each fundamental elementary process. However, as indicated above, the social importance of such special skills as arithmetical computation is so great that the time spent in improving weak pupils in them is not wasted.

Weak pupils may retain specific skills if thoroughly automatized. — There is reason to believe that if the simpler fundamental processes in reading, writing, arithmetic, and spelling are made thoroughly automatic in the case even of slow pupils, by years of short, interesting, effective periods of drill in school, these special skills may persist after the pupils leave school. This does not mean that these skills will not deteriorate if unpracticed after the children leave school, but if the skills have been thoroughly automatized in school, they can be quickly relearned, polished up again, with little practice in later life.

Few songs remembered by monotone is an example of retained skill. — An ordinary example of such persistence of

a specific skill even when there is general native incapacity is found in the case of the monotones described earlier in the chapter, where the father, although he has not learned any new songs, can still sing a few songs learned in adolescence. The persistence of these, to be sure, is due not only to the original automatizing of them but also to their occasional recall at later periods in life. The similar persistence of skill in swimming, skating, and baseball through years, often with prolonged lack of practice, furnishes further examples.

Typewriting skill deteriorated during disuse, but quickly relearned. — More scientific evidence of the persistence of specific skills, although not coupled with original native incapacity in this case, is found in elaborate experiments on typewriting conducted by Swift, who found that although his typewriting skill deteriorated greatly during two years of disuse, in a very few hours of practice he was able to bring it back to its original level. Students interested in examining the scientific evidence on the persistence of special skills should read pages 243–258 in Thorndike's "Educational Psychology, Briefer Course."

Summary concerning individual teaching of weak pupils. — Up to this point in our discussion, by means of simple examples of monotones and of pupils who need individual drill in the fundamental processes of arithmetic, we illustrated a number of general points concerning individual differences in capacity and individual instruction. These have all pertained to *weak* pupils or pupils who are having special difficulties. These points may now be summarized as follows:

1. A specialized inability shown by any pupil may be due either (1) to inborn incapacity or (2) to misunderstanding and lack of practice arising from absence, inattention, or defective teaching.

2. Where the inability is due to inborn incapacity, treatment of it will depend on its social importance.

Courtesy of The University of Chicago Elementary School

BRIGHT PUPILS EXCUSED FROM CLASS TO SPEND THEIR SPARE TIME PROFITABLY IN LIBRARY READING

See story on opposite page

a. If very essential for social service or increased happiness, great care will be taken to bring the weak pupil up to satisfactory standards.

b. If the inability relates to a subordinate and relatively nonessential feature of the pupil's later life, he may not be given much special attention.

3. Where the inability is not due to native incapacity, careful diagnosis and a few minutes of skilled individual teaching will often suffice to enable the pupil to overcome his difficulties and forge ahead.

Proficient pupils. Varied assignments. *Excused from drill.* — The discussion of the individual needs of pupils who are *having special difficulties* presents, however, only a part of the problem of adapting teaching to individual differences in capacity. Equally important are the cases of *pupils who have mastered the processes* with which most of the class is concerned and can spend their time and energy to better advantage on other assignments. Here, again, we find a simple example of what can be done for such pupils in the use of the standardized printed drill materials in arithmetic. As described on page 254, with such materials each pupil practices, during the ten-minute drill periods, upon such problem sheets as the tests have indicated for him. If the tests have shown that he *is sufficiently skilled* for his grade in all the fundamental processes, then he is *excused* from the drill and spends his time upon

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Story of the picture on opposite page. — In the school library stacks shown in this picture are hundreds of volumes of fascinating literature for children of all ages. These volumes vary from "Tom Sawyer" and "How to make Airplanes" to H. E. Marshall's "Scotland's Story" and Stevenson's poems. The fast pupils who have completed their required work are often excused to go to the library for supplementary study or free reading. Thus the picture illustrates provision for individual differences.

other assignments. The importance of excusing the proficient pupils from further drill is emphasized in one of the standard drill systems in the following words:

Children who complete all the tests successfully do not need the slightest drill work in the four operations as they already have more than average adult ability in these skills. The author and the publishers hereby give emphatic warning that the drill lessons are designed only for children who need them, and that they should not be held responsible for the bad effects and loss of efficiency sure to follow the use of the drills with children who have already attained the desired goal. Failure to determine the needs of children and to adjust individual work accordingly is one of the greatest factors operating to decrease the effectiveness of almost all the drill work found in common practice. (**26**: 12)

Organization of supplementary assignments. — After the teacher decides to excuse capable pupils from drill activities in which they are proficient, the problem arises of devising supplementary assignments for them. The organization of such supplementary assignments is desirable, moreover, not only for pupils who are excused from drill activities but also for the more proficient pupils in every subject. Such pupils often accomplish in a short time the regular assignment of work intended for most of the class, and, unless additional opportunities are opened for them, they may waste much of their time and possibly misuse some of it in devising mischief. An illustration of what may be done in the way of organizing varied assignments for the bright and the mediocre and the slow pupils is contained in the following quotations:

An experiment with minimum and maximum assignments. — The grade teachers of the Elkhart public schools tried out an experiment during the past year with what may be called a system of minimum and maximum assignments of lessons. The purpose of the system was to provide a course to meet the different abilities of different children and thus to increase the promotion

rate among them; also to test out the scheme as a forerunner to the planning of a course of study along the same lines.

Varied in quantity of subject matter: examples. — The minimum assignment was that expected of all pupils in a given class, while the maximum was the assignment given to the more capable. . . . The two were supposed to differ merely in the quantity of subject matter. For example, in a geography lesson on [a foreign country], the minimum assignment was a certain portion of the text, with an addition, for the maximum, of reports on such information as [its] government, its military system, the growth of certain centers of industry, effect of certain physical features, points of historical and artistic interest, etc. A certain minimum arithmetic assignment consisted of ten problems in local banking, while the maximum provided several additional problems, one or two of which were more difficult; also an assignment of a future report on a special study of banking. A seventh-grade history assignment had as the minimum the causes of the Revolutionary War, while the maximum provided for a more intensive study of certain causes, for instance, the British idea of taxation and representation; also a search in reference books for causes not commonly stated. Maximum assignments in the above or other subjects might provide merely more extensive subject matter in a lesson or more intensive preparation of certain phases of it. The minimum assignment in every case was the quantity of work it was reasonable to expect of the majority of the slower ones in the class. The sum total of such assignments for the term had to be sufficient to give at least the minimum preparation for the next term's work.

Increased promotion rate. — The results of the experiment were tabulated at the close of the school year and show the following outcome. In some few schools there was no noticeable difference in the promotion rate, due in most instances to the fact that the teacher was inexperienced or was new to the city. . . . At least nine tenths of the corps found that the scheme has greatly increased the promotion rates. The average gain for the entire city was 18 per cent. . . . The plan operated easily and brought best results where the teacher had all pupils of one half-grade and in grades organized on the departmental system where there were several sections in each half-grade. (**5**: 219–220)

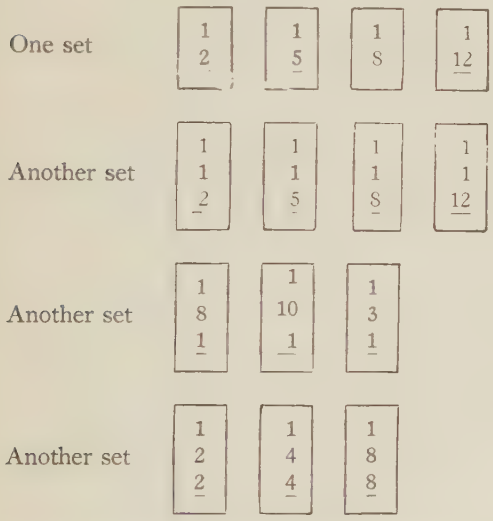
Special technique needed with varied assignments. — The effective carrying out of such a scheme of varied assignments necessitates (1) careful, detailed formulation of the course of study in each grade; (2) printed or mimeographed outlines of the minimum and supplementary assignments; and (3) facilities for supplementary study, including supplementary books in the classrooms, school library, public library, and in the homes. Moreover, a special technique is needed to avoid overstimulating the ambitious, nervous pupils, neglecting the poor pupils, and overworking the teacher. In the article quoted above, E. H. Drake gives an account of the experiences in the Elkhart schools in devising such a technique.

Examples of equipment, assignments, and technique for supplementary individual work. — The following paragraphs describe practices actually followed by teachers in organizing supplementary assignments. The statements were written by experienced teachers in the author's summer classes. The first one is by a teacher of eleven years' experience.

In the first grade. — This is actually what I have done with first-graders [writes the teacher]. It is actual experience, not mere theory.

It does not take me long by grouping and regrouping a class or three dozen or more first-graders to get into one group four or five who can go faster than the rest of the class. These pupils do the work of the *regular* division that they are in and then, since they get through so much more quickly, *blackboard* work with *harder* material is waiting for them "over in the corner." Or, if they finish their occupation lesson, they get a supplementary reader from the bookrack "in another corner," and read to themselves; later they have a few minutes' opportunity to read orally to me, to make sure they have mastered the mechanics of reading. Later in the year, they *tell* what they read about. I encourage bright children to take my supplementary readers home to read *to* mamma, *not* mamma to child. I also encourage them in bringing their own material. I can often get new books in that way and we exchange, so each child reads the others' books.

In arithmetic I have sets of graded "number" cards, the sets getting "harder" and "harder." These cards the bright ones use at odd times to avoid wasting their time and to increase their skill with numbers. I make the cards myself. The following are samples of flash cards requiring only the answers and used by the children in drilling themselves.



You see these become harder and harder. I keep these sets and pass them to the three or four bright children, and as they can do the easier ones, I give harder ones.

In the construction work, each pupil's handiwork is praised and preserved and extra models requested and preserved.

As a special incentive to the bright pupils in reading to apply themselves, I excuse a few from the room to go to read to the principal (he is always delighted (?) when he is so busy). This is worth all the praise of anybody. Again they "visit" the next higher section. For instance, when the brighter ones have covered all the required ground and are on "tiptoe" ready for more, they are allowed to "visit" (it may be in the second grade) and try their wits against the children there. Nearly always this is near

the end of the term. The first *week* the pupils visit an *hour*, the *next* week they stay half a day, and if these *quick*, *bright* "shining stars" are capable enough, they go on to the second grade and cease to be a "visitor in their home" but become a real wide-awake second-grader. I never hold the bright ones back. Grouping and regrouping sends them on to the next higher division after they can *read fluently and independently* in any first-grade reader. I keep always at least six different kinds of first readers and turn from one to the other, so as to strengthen the first-grader's vocabulary.

Every term a few, four or five pupils, go to the next higher section and *stay*. I hardly ever have complaints that the bright ones I send up are behind the class they enter. I keep inquiring to see if I am sending on pupils too fast. If I am, I "slow up" and don't push so fast the next group of "shining stars."

Further technique in first grade. — Another first-grade teacher described the library table which was supplied in the corner of the room for supplementary activities, including cutting up old magazines to secure pictures for language work and words for reading drill. Two special points of technique she brought out in the following paragraphs:

Low cupboard. — All supplementary materials are kept in a low cupboard which is easy for the children to reach and to keep in order. Children cannot stand on tiptoe on a chair and reach as far as they can for something without disarranging the other materials and should not be expected to do so.

Children trained to use judgment. — I try as far as possible to teach my pupils to judge for themselves when they have finished their work and are ready for extra work. For example, the children had been assigned a lesson in their regular textbooks for study. They were given several different questions to find out the answers and were told that when they had finished that work they might go to the shelf and get a new book; a set having been received that morning.

The children hastily read the material given them, and one or two immediately went for the new books before they could answer the questions asked.

At recitation time, these children were questioned about their reading lesson and the rest of the children were asked to decide whether it was *fair* for the children to go after the new books before they had their lesson. Of course the class said *no*, and the children were more or less in disgrace with their classmates for some time.

If the privilege is too much abused, I take it away from the entire class for one day, and public sentiment is strong enough to force the unconscientious pupil to do what he should.

Similar technique in middle grades. — Obviously, if first-grade children can be trained to use supplementary materials for spare moments as has been described, it is a relatively simple matter to organize a similar technique with older children. Consequently, one further example will suffice to illustrate the practice of a teacher in the middle grades as she describes it in the following paragraphs:

I have, in one corner of the room, two kindergarten tables placed together so as to form one fairly large table. On this table I have placed several books of good short stories. There are also short stories cut from newspapers or magazines and pasted on cardboard. On another similar table I have railroad folders, books of travel, and short stories of children of other countries. Where a pupil has satisfactorily completed his study lesson in arithmetic or geography or any subject, he goes to the table which we are using for that week, gets a book, and takes his seat. (We alternate the material, some weeks using stories for mere drill in rapid silent reading and some weeks the travels for facts about the world.)

When the recitation is called, if it is an oral recitation, I watch closely those pupils who have done supplementary work, and if their other work has suffered, they are deprived of the privilege of going to the table until their own work improves. If the work is written, each pupil who did supplementary work during the study hour places "S" on the top of his paper, and grades which are not satisfactory are dealt with in a like manner. I have found by making clear these results early in the year that after a few examples I seldom have to resort to the enforcement of the rule.

When the pupils report on their supplementary reading is the most interesting time of all. During the week, usually on Friday, we will find a time for "discussions" or "Supplementary Table Talks." Then, if it is story week, we hear reports of the stories read; not stories retold, as that would be a useless waste of time, but each pupil is asked to tell some point in a story which appealed to him. We discuss different stories together, which ones we like best and why, certain characters we liked and why. I find it an excellent help for silent reading. If it is a week for travels, we do the same thing, except that we discuss various countries or parts of our own, or take imaginary journeys.

The supplementary work is often varied at the children's own suggestion. For example, we decide next week we will all bring in all the stories we can find about a certain country, a certain man, by a certain author, on a certain subject, etc. Then for the week we will study them.

These discussions are excellent language drill. They give the ideas to the slower pupils who have not had the chance to read, and, as no one child likes to be left out of the discussion, they are an excellent stimulus for good class work.

Among the stories we often find one which, at the pupil's own suggestion, we can dramatize. Then comes interesting work.

Enriched education from use of spare moments.— Finally, we may notice the general educational results which follow in rooms where the teachers have carefully organized supplementary work for the spare moments of rapid learners. Quite a *liberal* education may frequently be acquired by such pupils just from the supplementary work which they do. A principal of a building described such results in the case of a sixth-grade teacher who arranged in her room a supply of books on history, geography, and science selected from the school library. The principal wrote as follows concerning the teacher:

Her pupils have the most extensive reading habits of any room in the building, and are the best-informed grade in school on the outside world.

Administrative provisions for the fast and slow. Individual promotions. — Adequate practical provision for the slow and the fast pupils calls not only for varied assignments and teaching but also for the promotion of each pupil according to his individual needs. The necessity and value of special promotions for *very bright* pupils are suggested by the following typical example:

Robert was twelve years old, beginning the second half of the eighth grade. His teachers reported him indifferent, doing only ordinary work and inclined to be the center of schoolroom disorder and organized insurrection. Parents noted that, though previously much interested in school, the boy now disliked to attend; he disliked the teachers and wanted to drop out. Robert insisted that the studies were not interesting, that he knew all he wanted to know about them already. Mental [tests showed that he had attained] a mental age probably greater than that of some of his teachers, who bored him to death by treating him as an ordinary twelve-year-old. He was recommended to high school, entered three weeks late, led his class at the end of six weeks and at every subsequent interval when marks were given. More important, his whole attitude toward school was changed, because the advanced work was a real challenge to his mental ability. (**29**: 29)

Even the failures may be helped by promotion. — The careful organization and administration of such individual promotions on a large scale in actual practice is well described by Superintendent C. S. Meek in an article in the *Elementary School Journal* for April, 1915, Vol. XV, pp. 421–431. Principals and superintendents should read this article carefully. One of its most striking features is the description of the individual promotions of *dull* pupils who have really failed according to ordinary standards. Concerning these cases, Meek says:

The standard for promoting the dull pupil is entirely individual. He is not compelled to do all the work of his present grade before he is permitted to pass to the next. He is even allowed to pass

on without manifesting enough ability to justify the hope that he may be able to do the work of the advanced grade. The question is reduced to the one consideration, Would he do better if advanced than he would as a repeater?

In every grade of twenty which is promoted in Boise, there is an average of two who have not satisfactorily completed the work of the lower grade. These are accepted by the teacher as special cases to which she is expected to give individual attention both in and out of school hours. She is not held responsible for the work of the special pupil, but is given credit for all progress that she can stimulate. She gets the enthusiastic coöperation of the home, for the parents know that their unfortunate offspring has been treated generously and leniently. They thus aid in every possible way to bring their child up to the standard. This policy of dealing with laggards has the indorsement of the great majority of teachers. The consensus of opinion is that those who are permitted thus to advance more nearly approach the standard of the advanced grade than they would of the lower grade had they been compelled to repeat. This is not surprising when one considers how little there is in the curriculum that is so connected and consecutive that one year's work depends upon the completion of the subjects of the previous year. (**8**: 423)

Encouragement and confidence stimulate promoted laggards to better efforts. — The success of the practice of promoting retarded pupils finds further explanation in the greater confidence and interest which it inspires in the promoted laggards. In speaking of the stimulating effect of feelings of confidence and success and the opposite depression resulting from failure, Freeman says:

Confidence in one's ability results in the stimulation of one's mental and physical power and in the release of energy for the task. The consciousness of failure and the expectation of failure, on the other hand, result in the drying up of the sources of one's energy. . . . Confidence [is greatly affected by] previous success. However one may endeavor to work up artificially a feeling of confidence, one is always influenced to some degree by previous

failure or success in this particular sort of work, or in work in general. As a consequence of this fact it is necessary that the work of the child be so managed that he shall possess the required degree of confidence in his ability. . . . This paralyzing effect of failure is evident in the case of children who have to repeat a grade. It is a matter of common observation that such children never work so hard as those who are taking the grade for the first time. Children who have failed in part of their work have been found to do better work if they were promoted than if they were made keenly conscious of their failure by being forced to repeat a grade. (**27**: 305–306)

Supervised study periods for individual teaching. — Another administrative provision which is necessary in order to secure appropriate individual teaching and advancement is to include in the daily program regular periods for teaching individuals and supervising their study. There may be a single period or several study periods a day during which such teaching is carried on. The most successful example of such organization on a large scale was instituted some years ago in Batavia, New York, and is described at length in W. C. Bagley's "Classroom Management," chap. xiv. The results of fourteen years' experience with the plan are described by Superintendent Kennedy of Batavia in the *Elementary School Teacher*, June, 1912, Vol. XII, pp. 449–459. Both of these references should be read by principals and superintendents who are interested in meeting the needs of individual pupils.

Scientific, objective, precise studies of individual differences. Amounts of difference. — Up to this point in our discussion, by means of examples of monotones, varied drill lessons on fundamentals, supplementary assignments for bright pupils, etc., we have presented a general view of the *opinions* and *practices* which prevail in varying class instruction and promotions to meet the needs of individual pupils. We shall now take up a more *scientific* discussion of the

topic as the term *scientific* is used on page 110 above; that is, we shall present results of investigations that are mathematically precise, objective, verifiable, expert, and impartial. The first question which we shall consider with mathematical precision is the *amount* of difference in ability between the brightest and the slowest children in the same class.

Reading rates. — One of the most *objective* examples of such differences is found in the *rate* of silent reading — words per minute. How many words per minute would you expect the slowest child and the fastest child in a third-grade class to read if they were carefully tested while reading a simple story according to the following directions?

Courtis Silent Reading Test. — Directions to be read aloud by teacher and pupils together.

This test is given to see how well you can read to yourself. When the signal to start is given, open the cover and begin to read the story. Read *silently*, and only as fast as you can get the meaning; for when you have finished, you will be asked to answer questions about what you have read. You will be marked for both how much you read and how well you understand it, but it is better to get the meaning of the story than to read too fast.

When the examiner says "Mark," draw a line around the last word read, and keep right on reading. If you should finish before the examiner says "Stop," close your paper and wait quietly until the others finish.

In a well-graded, small class, fastest pupil's rate equals twice the slowest. — The following table shows the number of words per minute actually read silently by the children of a third-grade class (3 B) containing 19 children.

1 child	read	from	76	to	100	words	per	minute
8 children	"	"	101	to	125	"	"	"
4 "	"	"	126	to	150	"	"	"
3 "	"	"	151	to	175	"	"	"
2 "	"	"	176	to	200	"	"	"
1 child	"	"	201	to	225	"	"	"

It will be noticed that the fastest child read more than twice as fast as the slowest. Similar differences appear in the other grades, as shown in the table below; for example, the slowest children in 6 A read from 151 to 175 words per minute, while the fastest read from 376 to 400 words. A page of this book contains about 400 words; hence if it contained easy story material the fastest reader in the sixth grade would read a page in about one minute, while the slowest would take more than two minutes.

COURTIS SILENT READING TEST

(The University of Chicago Elementary School)

Words read per minute	Number of Pupils		
	Grade 3 B	Grade 4 A	Grade 6 A
76–100	1	1	. . .
101–125	8	0	. . .
126–150	4	0	. . .
151–175	3	2	2
176–200	2	5	1
201–225	1	7	4
226–250	. . .	4	10
251–275	. . .	1	3
276–300	. . .	1	1
301–325	. . .	. . .	2
326–350	. . .	. . .	1
351–375	. . .	. . .	1
376–400	. . .	. . .	1
	19	21	26

In larger classes, fastest reading rate equals three or four times the slowest. — The above differences were found in the Elementary School of The University of Chicago, where the children are very carefully graded into small classes and individual promotions and demotions are carefully made. In public-school classes where larger groups

prevail, and individual adjustments are less frequent, slightly greater differences often occur, as shown by the following results from the same test:

COURTIS SILENT READING TEST

(Results from large classes, not closely graded[1]
Read each row horizontally)

NUMBER OF PUPILS	GRADE	SLOWEST RATES	FASTEST RATES	SLOWEST DIVIDED INTO FASTEST RATES
47	III	40 to 59	220 to 239	about 4
54	IV	60 to 79	260 to 279	about 3

Even greater differences in arithmetic scores. Fastest equals eight times slowest. — When we turn from differences in reading rate to differences in speed in working arithmetic problems an even greater contrast appears between the slow and the fast pupils. For example, Courtis reports from tests of a New York City eighth grade containing 48 children the following results in an arithmetic test. (**23**: 333)

1 child	made a score of	2		8 children	made a score of	10			
0 children	"	"	3	4	"	"	"	11	
2	"	"	"	4	3	"	"	"	12
6	"	"	"	5	3	"	"	"	13
4	"	"	"	6	1 child	"	"	14	
6	"	"	"	7	0 children	"	"	15	
4	"	"	"	8	1 child	"	"	16	
4	"	"	"	9	1	"	"	"	17

Quality of arithmetical thinking less restricted by physiological limits. — From this table it appears that the slowest child made a score of 2, while the brightest made a score of 17, or *eight* times as large as the slowest. This

[1] These results were kindly furnished by Mr. S. A. Courtis from his private files.

difference is greater than that found in the case of reading-rates where the fastest child read only two to four times as fast as the slowest in the same class. In the case of rapid silent reading, without skipping, scarcely any adult reads at a greater rate than 700 words per minute. There seems to be a physiological limit which cannot be passed — a limit which is probably set by the rapidity with which the eyes can move across the page and see the print during the pauses which they make. In the case of arithmetic problems, however, one's speed is much less restricted by such physiological matters; that is, one can work problems almost as fast as one can *think*. This fact probably explains the greater disparity between the slow and the fast in arithmetic, the difference between the worst and the best being largely a difference in the speed of *thinking* or the *quality* of the thinking.

Objective, precise measures of differences in quality of achievement are difficult to devise. — It is very much more difficult to compare and measure differences in the *quality* of mental products than differences in the *quantity*. For this reason we began with rates of reading, — *words per minute*, — where the measurements are in objective units (number of words and minutes) which are tangible, reliable, and easy to compare. In the case of arithmetic, the task of measuring precisely differences in achievement is somewhat more difficult than in rates of reading, owing to the necessity of devising lists of problems in which the relative difficulty of the problems is known. However, experts in educational measurement have devised such lists, and the results from the Courtis test described on page 292, above, furnish one example of their use. When we try to measure differences in certain other abilities, such as the ability to *write compositions*, the difficulties of precise measurement are greatly increased. However, even here educational experts have succeeded in arranging sample compositions according to

their *quality* so as to give us a scale for measuring differences in abilities in composition. The first scale for this purpose was made about 1912 by Professors Thorndike and Hillegas after many months of study and experimentation. The sample composition which they used in their scale to represent approximately zero ability began as follows:

Dear Sir: I write to say that it aint a square deal Schools is I say they is I went to a school. red and gree green and brown aint.

Qualities of compositions compared precisely by composition scales. — In order to devise a measurement scale for comparing the composition abilities of *sixth-grade* children, Breed and Frostic (**25**) secured a large number of compositions written by such children under exactly similar conditions upon the same theme. The pupils were asked to finish in writing a story which told about a picnic party of some children and their teacher. The story described their starting in a motor boat, the engine of which stopped after they had proceeded some distance. The pupils who wrote the compositions were told to imagine what followed and to complete the story. One of the poorest papers handed in read as follows:

.2

The hanjict shop for there
there was so many in it. After
a little they it going. And
they to pleace were the the picine
was. They all get out of the
hounce and but there thing
down
on the table and rain out to
play. After they were platy
the had there lunce. And
They had a very nice time.

A somewhat better paper read in part as follows:

2.7

When the enginer stop, one
of the boy took his shoes and
off
stcocking ✓ and got out into the
river and bushe the bout a little
so as to stare the enginer
a going, when that had
stared the bowt went aright.
And they went rideing
around the river where
having a nice time went
one of the girl saw a water —
lillies and they try to pick when she
fell in the river but she got
aright, her cloth were wet
some but they soon try, and
she got her water lillies.
When they were throu-
ght rideing they got out and

A composition of *average* merit began thus:

4.7

Jack the one who was runing
the launch said, "lets take these pales
and push the launch to shore. Yes! Yes!
let do said all; we took the poles
and tu) pushed it to shore. Jack
got out and looked around. He saw
a house over yonder, he went over
to see if they had any gasoline,
when. he got there and ask they
had none. When he came back

The best composition had the following beginning:

9.7

"What is the matter"? asked Miss Green, the teacher of the school, to the man who was running the little launch. "I'm sorry mam," he said, "But the gasoline has given out." Some of the more timid children began to cry. "Hush," said the teacher a little sternly, "We cannot let this accident spoil our picnic." "Why can't we have our lunch right in the boat?" cried Mary, Brightly. "That is a fine idea, Mary," the teacher said gratefully. With the help of the pupils Miss Green managed to set the lunch on the floor of the boat. After lunch their spirits began to rise, and they amused themselves by telling stories.

All this while they were drifting along quietly. "There is a launch coming towards us!" exclaimed a small

Enormous difference in quality between best and poorest compositions from a class. — By careful scientific procedure Breed arranged the compositions upon a scale of merit in which the poorest one given above received a rank of .2, the second one a rank of 2.7, and the best a rank of 9.7. If these numerical values may be compared, we might say that the excellent composition is 48 times as good as the poorest and 3.6 times as good as the second one. However uncertain such precise comparisons of quality may be, the compositions illustrate the enormous disparity that exists between the poorest and brightest sixth-grade pupils in composition. While the brightest might write attractive stories with few suggestions from the teacher, the poorest would be barely able to compose a simple letter with great help.

In class teaching, adapted to the average, the brightest pupil may mark time while the poorest drags or flunks. — In our comparisons of rates and qualities of school work up to this point we have compared merely the extremes — the fast and the slow, or the excellent and the poor. More useful comparisons for the teacher to make are found in the answers to the following questions:

If the pace of the instruction is adapted to the *middle part of the class,*

1. How much spare time will the brightest pupils have?

2. How much too fast will the pace be for the slowest pupils?

The general answers to these questions are as follows:

1. The brightest pupil may have from $\frac{1}{4}$ to $\frac{1}{2}$ of his time free to do as he pleases.

2. The pace will be about twice as fast as the pace of learning of the slowest pupils; that is, the slowest pupils will be dragged along at such a fast pace that they will fail in much of the work. As a result they come to be regarded as hopeless flunkers, whereas often they could make satisfactory progress with a slower pace and more careful instruction.

Distribution of differences in ability. *How many fast and how many slow pupils in each class?* — The precise mathematical demonstration of such differences in capacities for learning has been the principal factor in bringing about the practical provisions for individual instruction for the slow and supplementary assignments for the fast which were described above on pages 280–286. In planning special provisions for these extremely fast and extemely slow pupils it is desirable for the teacher to understand what proportion of the class they are likely to comprise. This brings us to the question of the distribution of differences in capacity. This distribution may be illustrated by using the data in the Courtis arithmetic test given in the table on page 292 to make the picture on page 299.

Graphic representation of distribution of pupils by piles of blocks; arithmetic scores. — As a first step in our study of Courtis's table let us arrange it horizontally (as shown below), instead of vertically.

Number of pupils	1	0	2	6	4	6	4	4	8	4	3	3	1	0	1	1
Score based on number of problems done	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

The first numerical *vertical* column of this table reads, "1 pupil made a score of 2." The second column reads, "0 pupils made a score of 3." A column near the center reads, "8 pupils made a score of 10," and the extreme right-hand column reads, "1 pupil made a score of 17."

We may now represent these results in graphic or pictured form by the following device: Imagine the lower horizontal row to be written along the blackboard ledge, thus:

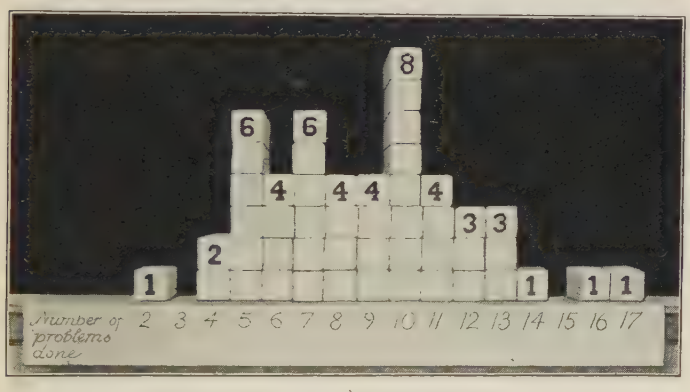
Number of problems done	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Then place on the ledge, above *each vertical* column, *one wooden block* for each pupil who made the score indicated in the column. Thus, above the extreme left-hand column we would place 1 block; above the extreme right-hand column we would place 1 block; above the column for a score of 10 we would pile 8 blocks, 1 for each pupil who made this score. After we had completed all the columns of blocks, the whole pile on the ledge would have the appearance shown in the figure on page 299.

Rates of reading. — We get a somewhat similar form of distribution if we pile blocks to represent the *sixth*-grade reading rates shown in the table on page 291. To carry out the process with these rates, first imagine the columns written horizontally, as follows:

Number of pupils	2	1	4	10	3	1	2	1	1	1
Words per minute	151 to 175	176 to 200	201 to 225	226 to 250	251 to 275	276 to 300	301 to 325	326 to 350	351 to 375	376 to 400

Then imagine the lower row written along the blackboard ledge and above each vertical division on the ledge pile the



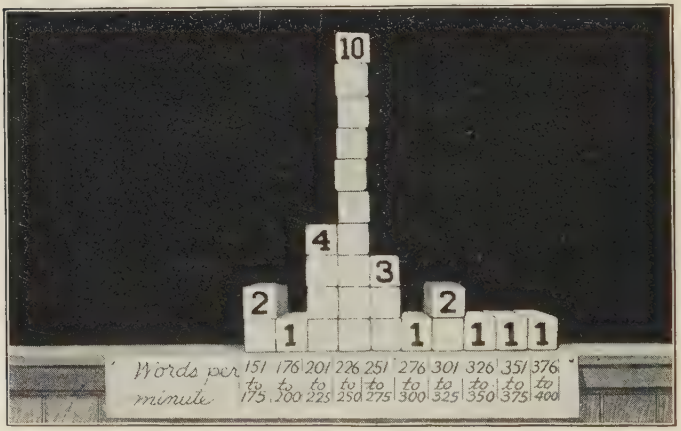
BLOCKS PILED ON BLACKBOARD LEDGE TO REPRESENT DISTRIBUTION OF ARITHMETIC SCORES

The single block at the left indicates that 1 pupil made a score of 2. The block at the extreme right indicates that 1 pupil made a score of 17. The tallest column indicates that 8 pupils made a score of 10

number of blocks corresponding to the number of pupils that have read the amount indicated. This procedure gives the figure shown on page 300.

Normal frequency surface; middle abilities frequent; extreme abilities infrequent. — It appears that the piles of blocks (or distribution surfaces) for abilities in arithmetic and reading are similar in general form; that is, the middle abilities are piled high with several pupils, while the extremes are low — in other words, there are few bright pupils and few dull ones. If a larger number of pupils were tested (there

were 48 in the arithmetic class and 26 in the reading class), the piles, or surfaces, would tend to assume the general form shown in the figure on page 301, which represents the heights of 1000 ten-year-old boys, distributed by a somewhat similar device, each boy being represented by a short horizontal line instead of a block. In general, measurements of



BLOCKS PILED ON BLACKBOARD LEDGE TO INDICATE DISTRIBUTION OF READING RATES OF PUPILS IN GRADE 6 A

The tall shaky column indicates that 10 pupils read from 226 to 250 words per minute. What do the 2 blocks at the extreme left indicate? The single block at the extreme right indicates what?

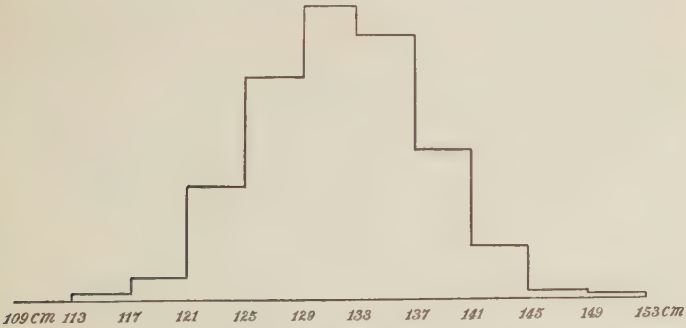
any human trait, physical or mental, in a group of person of the same type and age tend to show this form of distribution. It is known as the normal-frequency surface or, when shown in outline as at the bottom of page 301, as the normal-frequency curve or normal distribution curve.

Only a few pupils need special attention and assignments in each subject.—With a knowledge of this form of distribution of abilities in spelling or arithmetic or reading or handwork, the teacher should form the habit of thinking

of most of her pupils as *clustered* or compacted with slight variation near the middle or average ability, but with a *few*

APPROXIMATE NORMAL SURFACE OF FREQUENCY, REPRESENTING IN CENTIMETERS STATURE OF 1000 TEN-YEAR-OLD AMERICAN BOYS

bright ones and a *few slow ones* far removed from the average. For most of the class, the same instruction and the



APPROXIMATE NORMAL DISTRIBUTION CURVE. SAME DATA AS THAT PRESENTED ABOVE, BUT REPRESENTED HERE IN OUTLINE

From Thorndike's "Individuality"

same pace in any subject will be suitable, but for the few extreme pupils special provision must be made to avoid

having the bright, useful pupils wasting their time, and also to avoid having the slow ones dragged along at such a rate that they become "flunkers" and fail to progress through the school and receive the training that each of the higher grades has to offer.

Causes of individual differences. *Why do some learn easily and others with difficulty?* — Up to this point in our *scientific* study of individual differences in ability we have treated the *amount* of difference and the *form of distribution.* We shall now consider briefly the *causes* of the differences: that is, why one person can learn to spell easily while another remains a poor speller in spite of prolonged careful instruction; why one pupil can master the most difficult problems in arithmetic while another, who has had the same instruction, fails in the subject. Incidentally we referred to possible causes of such differences in the examples with which the chapter opened. We noted in the case of monotones and sweet singers within the same family that the difference might be explained by inheritance from the father who is a monotone and from the mother who is extremely musical. In the case of the varied amounts of drill needed in arithmetic, we noted that the difficulties of a retarded pupil might be due to (1) inborn incapacity or (2) absence, inattention, or poor teaching. We asserted that if the latter cause prevailed, the difficulty would often be overcome by a little skilled individual teaching. On the other hand, if the retardation was due to inborn incapacity, it could not be overcome so easily, but called for prolonged patient treatment by the teacher just to give the child a mastery of the minimum essentials in the subject.

Inborn, native capacity is an important factor. — In order to make clear the part played by inborn capacity or incapacity for learning in determining a pupil's possibilities and abilities, we shall refer briefly to the careful, objective, scientific investigations that have been made in this field.

Idiots, imbeciles, and other feeble-minded usually born deficient. — In the case of idiots, imbeciles, and other feeble-minded children, it is now established by objective, precise, scientific studies that their inability to learn is not due to lack of instruction or care, but (except in the case of accidents or disease) is due to their characteristics at birth, their inborn equipment. Students who are interested in delving into the scientific evidence on this topic should read H. H. Goddard's "Feeble-mindedness, its Causes and its Consequences." (**22**.) Goddard studied carefully the life histories of some three hundred feeble-minded persons. He concluded that the feeble-minded condition was clearly due to heredity in 54 per cent of the cases, and probably due to heredity in 11.3 per cent of the cases. His summary of causes (**22** : 437) is as follows:

Clearly due to heredity	54 per cent
Probably due to heredity	11.3 per cent
Ancestry showing brain diseases	12 per cent
Due to accident	19 per cent
Unexplained	2.6 per cent

Feeble-minded extremely limited by lack of natural capacities. — No matter what the original causes, however, the very limited possibilities of learning possessed by the feeble-minded appear in all investigations of them. Their possibilities in industrial training are shown in the following table by Goddard. The column headed "Mental Age" indicates that the idiot, imbecile, or moron, even though he be actually many years older, possesses the mental possibilities of a child from one to twelve years of age, as indicated in the classification. Thus a high-grade imbecile, even though he be actually 16 years of age, would possess only the mental possibilities of a normal child of 6 or 7. He could learn to do only tasks of short duration such as washing dishes, dusting, or little errands in the house. (**22** : 581)

INDUSTRIAL CLASSIFICATION

MENTAL AGE	INDUSTRIAL CAPACITY	GRADE	
Under 1 year	(*a*) Helpless; (*b*) can walk; (*c*) with voluntary regard	Low	Idiot
1 year	Feeds self. Eats everything	Middle	
2 years	Eats discriminatingly (food from non-food)	High	
3 years	No work. Plays a little	Low	Imbecile
4 years	Tries to help		
5 years	Only simplest tasks	Middle	
6 years	Tasks of short duration. Washes dishes	High	
7 years	Little errands in the house. Dusts		
8 years	Errands. Light work. Makes beds	Low	Moron
9 years	Heavier work. Scrubs. Mends. Lays bricks. Cares for bathroom		
10 years	Good institution helpers. Routine work	Middle	
11 years	Fairly complicated work with only occasional oversight	High	
12 years	Uses machinery. Can care for animals. No supervision for routine work. Cannot plan		

The great lack of natural capacity for ordinary public-school work which exists in the case of feeble-minded children who are found in public schools, and the small amount of progress which they make, are suggested by the following summary from Wallin's study of some 286 cases in the St. Louis schools. He says:

We do not seem to have found any considerable number of feeble-minded school children who are able to do third-grade work successfully, except possibly in one or two branches. The *possible* pedagogical attainments of the majority of them have varied from decidedly less than kindergarten standard to second-grade standard. (**17**: 597)

Genius and eminence largely due to inborn equipment. Galton's precise, expert investigations. — In the case of the very bright and capable learners, those who become eminent, the geniuses in any line of human thought or endeavor, the objective evidence is not so easy to secure and study as in the case of the mentally deficient. Nevertheless, skilled scientific investigators, themselves men of genius and expert masters of the technique of studying human nature, have spent years in studying the lives of eminent persons by precise objective methods. The greatest of these investigators was Sir Francis Galton, himself a member of two eminent English families — the Galtons and the Darwins. In 1869 he published a book called "Hereditary Genius," in which he presented the results of his studies of about one thousand eminent judges, statesmen, commanders, literary men, men of science, poets, musicians, oarsmen, etc. The conclusions which Galton reached include the following:

> Men who are gifted with high abilities . . . easily rise through all the obstacles caused by inferiority of social rank.
>
> Men who are largely aided by social advantages are unable to achieve eminence, unless they are endowed with high natural gifts. (**23**: 361)

Only objective, precise, expert investigations should be considered. — Naturally, many persons will not believe Galton's conclusions, since they are not prepared to understand them any more than they can understand the work of the most advanced scientists in physics, chemistry, biology, astronomy, etc. However, just as the well-educated person accepts the conclusions of eminent astronomers concerning the heavenly bodies, so will he accept the conclusions of the expert Galton in the studies of human careers. Moreover, he will require that critics who endeavor to refute Galton's results do so by methods that are as scientific, as objective, as mathematically precise, and as impartial as those which Galton used.

If we do accept the results of impartial, precise, objective, scientific studies concerning mental defectives and men of genius, we shall believe that the differences in the attainments of these two extreme classes are due to a very large extent to the differences in their inborn equipment of capacities and instincts.

Similarly, mediocre learners are strongly influenced by inborn equipment; Galton's study of twins. — When we turn from the attainments of the extreme types to the attainments and progress of ordinary learners, we find that the same general conclusion prevails; namely, that their original inborn capacities influence profoundly their possibilities of learning and achieving. A most interesting study made by Galton of twins gives us some of our best evidence in this connection. Galton secured accounts of the lives, characteristics, and attainments of some 80 pairs of twins in England. Of these, about 20 pairs consisted of *dissimilar* twins; that is, the members of each pair were quite unlike in their characteristics from birth. The evidence in these cases, while not very precise, shows that similarity of experience and training had little influence in overcoming the original differences. The following statements by parents of twins give characteristic examples of this fact.

One parent said:

> They have had *exactly the same nurture* from their birth up to the present time; they are both perfectly healthy and strong, yet they are otherwise as dissimilar as two boys could be, physically, mentally, and in their emotional nature.

Another parent said:

> I can answer most decidedly that the twins have been perfectly dissimilar in character, habits, and likeness from the moment of their birth to the present time, though they were nursed by the same woman, went to school together, and were never separated till the age of fifteen.

Another said:

They have never been separated, never the least differently treated in food, clothing, or education; both teethed at the same time, both had measles, whooping-cough, and scarlatina at the same time, and neither had any other serious illness. Both are and have been exceedingly healthy and have good abilities, yet they differ as much from each other in mental cast as any of my family differ from another.

Another said:

They were never alike either in body or mind and their dissimilarity increases daily. The external influences have been identical; they have never been separated.

Another said:

The home training and influences were precisely the same, and therefore I consider the dissimilarity to be accounted for almost entirely by innate disposition and by causes over which we have no control. (**23**: 383)

Further reading on inborn capacities. — Readers who desire further scientific discussion of the inborn basis of human talents and achievements, presented in simple form, should read E. R. Downing's "The Third and Fourth Generation" and F. G. Jewett's "The Next Generation."

Treat each pupil sympathetically according to his talents and deficiencies. — From the study of the above paragraphs concerning the original nature of the mentally deficient, the geniuses, and twins of ordinary ability, the teacher should form the attitude of being interested in the inborn characteristics of each of her pupils as furnishing the fundamental starting point for her treatment of him. If the pupil is naturally very weak in arithmetic but very talented in art, she will be satisfied when he has mastered the fundamentals in the former, and will not deny him promotion for his deficiency. On the other hand, in art she

will endeavor to stimulate him to the richest possible development so that he may use his talent for the great benefit of himself and others.

Improvability. *Practically every capacity in a normal child is improvable.* — The fact that each child's ability to learn depends upon his inborn capacities should not lead us to be pessimistic concerning the possibilities of educating normal children. For example, although a child with natural musical talent may easily learn to sing *ten* songs sweetly and accurately while a natural near-monotone succeeds in learning only *one* indifferently, it does not follow that the near-monotone cannot be improved *somewhat* as a singer or that he should be entirely neglected. With sufficient skilled individual teaching the monotone might be taught to sing with fair correctness "My Country, 't is of Thee," "The Star-Spangled Banner," and a few other songs of sufficient social importance to justify the effort required. Similarly, although a bright young man of my acquaintance continued to be a relatively poor speller all his life in spite of careful individual teaching at home (while he was in the grades and high school) by his widowed mother, herself a skilled, experienced teacher, it does not follow that the instruction was futile or that his spelling was not greatly improved by it. *Without* any instruction he would not have been able to spell at all; without the special instruction by his mother he would have been an *atrocious* speller; whereas, *with* the school instruction and the special teaching he became merely a *relatively poor* speller, usually misspelling only two or three words in each letter which he wrote his mother after he went away to college.

Amount of improvements to be attempted determined by inborn capacity of the pupil and happiness of the multitudes. — In deciding how much improvement to undertake in school with each child we must consider his own inborn capacities and the cost to society of the teacher's time and

effort in improving him. Obviously, to try to make a grand-opera singer out of a monotone is a waste of time for all concerned. A striking example of the results of such undesirable efforts is found in the case of a very successful movie star and dramatic actress who for some years was on the grand-opera stage. While everyone marveled at her wonderful acting in the operas, the musical reviewers were unanimous in wishing that she would not sing, since her notes were commonly misplaced, being flat and unmusical. On the other hand, as a movie star she pleased all through her wonderful dramatic ability and made no one uncomfortable by her flat singing.

Almost every child is good for something. — Leaving out the idiots, imbeciles, morons, and morally incompetent children, we may say that practically every child is good for something, meaning that he can be made a useful citizen in general, and at least a fairly skilled worker in some special line. It is each teacher's business in the elementary school to help each child to keep moving toward *general* social usefulness as well as *specialized* social usefulness. In order to do this it is important for the teacher to realize the great variety of human capacities and the opportunities for each to be of service in the world.

Teacher should not judge children merely in terms of her own capacities. — In order to appreciate the great variety of human capacities and corresponding social opportunities, the teacher must avoid the danger of judging her pupils entirely in terms of her own capacities and temperament. As Thorndike says:

> [An] . . . error from which all of us suffer is to credit our scholars with natures like our own. We think of them as duplicates more or less of ourselves. If we are quick learners, we expect too much of them; if we have sensible, matter-of-fact minds, we have no patience with their sentimentalities and sensitiveness; if we are precise and neat and systematic, we fail to understand

how intolerable it is for them to lead a regular, orderly existence. Teachers need to add to the maxim, "See ourselves as others see us" the still more important one, "See others as they are." (**3**: 84)

The teacher is usually one who has [herself been successful with abstract thinking] and so is more in sympathy with it. [She] may even thoughtlessly sneer at the mental ability of those who lack it. "Your son will make a first-rate mechanic or grocer, but he is n't fit for high school," said such a one. The proper retort would have been, "Your school, then, is first-rate for one kind of a boy, but it is n't fit for the majority." (**3**: 31)

Varied richness of human nature; important capacities. — Many other examples similar to those given above could be cited which would reveal to us the great variety of capacities, the varied richness of human nature and its possibilities. A number of the most important of such capacities are discussed in the following paragraphs.

Expression through language. — The capacity for expression in language is present in all normal persons but in quite varying degrees. It should be developed in all persons to a considerable extent for practical daily use, but only those with special natural talent can become expert writers and speakers. A specialized form of this talent which presents interesting examples of its inborn character is the talent for poetic expression. The common statement that "poets are born not made," while it tends to overlook the influence of *training* in improving poetic expression, suggests the fundamental importance of the *inborn* talent. A striking case of such talent appeared in a third-grade child. At one time, when the teacher called on the child to recite, the latter said, "Excuse me a moment, Miss Troxell, I am writing a poem." The little girl fairly breathed poetry; she could n't help it. Similarly, the sixth-grade child who wrote the following verses probably ranks well above the average in inborn capacity for poetic and humorous expression.

THE JOYS OF SKATING

When the days are still and cold,
And I'm feeling kind o' bold,
Then I think it 's rather nice,
To go out and try the ice.

I go plowing through the snow,
But I know just where to go,
To the Midway where they skate,
There I 'll go and try my fate.

But when I have gotten there,
I can only stand and stare,
For the funniest thing of all
Is, I cannot skate at all.

Expression through plastic and graphic art.—The capacity for drawing, painting, modeling, and designing should probably be trained in all pupils to the extent of giving skill in rough sketching and diagrammatic drawing. As developed in those with special talent, it makes possible the beautiful products which we enjoy in pictures, statuary, buildings, dress, automobiles, landscape architecture, etc. Certainly the trained artists contribute greatly to our enjoyment of life. Opportunities for cultivating in school the capacities for graphic and plastic expression are shown in the Frontispiece and in the pictures on pages 152, 184, and 312.

Manual skill.—The social importance of manual skill is clearly shown by the work of skilled artisans and mechanics in the manufacturing of the necessities and luxuries of life. Many of the instruments of civilization designed by great inventors depend for their production upon the skill of thousands of workers. The Great War has been very influential in developing a broader appreciation of the importance of skilled labor. The capacity for acquiring manual skill is one of the most common of human capacities. Even some grades

Courtesy of The University of Chicago Elementary School

CAPACITY FOR GRAPHIC EXPRESSION USED IN TEACHING GEOGRAPHY

See story on opposite page. Compare the Frontispiece

of feeble-minded children who cannot learn reading or arithmetic can be trained to do things with their hands. On the other hand, when associated with good general intelligence, manual skill may even be an important factor in the highest grade of professional work, such as that of the surgeon or scientific chemist. Formerly the schools tended to neglect the development of this capacity. In a progressive school at the present time it is cultivated not only in connection with the constructive courses but is also utilized in geography, history, and arithmetic to vitalize these subjects, especially for the pupils who are interested in working in the sand pan, in making dwellings and garments of historical peoples, in making scenery for dramatic activities, etc. On the other hand, some very bright children are naturally very clumsy in manual work, and for them the constructive activities are often a great bore. In spite of their natural deficiency and dislike, however, they should probably be given sufficient sympathetic training to enable them to do such odd jobs of tinkering as occur in the ordinary home, and to understand the part which skilled manual labor plays in meeting social needs. For examples of school projects

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Story of the picture on opposite page. — The sixth-grade children shown in the picture on the opposite page are illustrating various features of deserts, including cañons, the cactus plants, etc. In their geography periods they have been studying the characteristics of regions of varied rainfall, from the very dry to the very wet. In their drawing periods the same types of regions are represented, the drawings being discussed in the geography class. The drawings depicting desert scenes were later used in the morning exercises of the assembled classes, when these children gave short talks on deserts in a manner similar to that shown in the Frontispiece. The picture illustrates the use of the instinctive interests in communication and artistic expression as well as provision for individual differences, since children with artistic talent who may not succeed in mathematics, for example, may shine in the work shown in the picture.

which utilize the capacity for manual skill, see the pictures on pages 8, 14, 65, 129, 132, 134, 136, and 230.

Capacity for musical enjoyment and musical expression.— Musical talent, when properly developed to the extent of skilled performing, contributes to life's enjoyment as do the other arts. Even persons of mediocre capacity acquire possibilities of frequent enjoyment of home and group singing through a moderate amount of proper training. It is probably a waste of time to try to train extreme monotones to sing *many* songs, but some of them may be taught by appropriate methods to play musical instruments and to enjoy listening to music.

Arithmetical computation. — As indicated in the chapter on the selection of subject matter, everyday life calls for extensive use of skill in simple calculations with small numbers. Special efforts should be made to give this skill to all normal pupils. The specialized character of the talent for numerical computation is shown by some of the "lightning calculators" who are often quite ordinary in other respects. Specialized absence of the talent is shown strikingly in the case of some of the great mathematical *reasoners*. For example, Kepler (1571–1630), one of the greatest of modern astronomers, formulator of three mathematical laws of motion to explain the movements of planets, was, according to Whewell, "not even a good arithmetical calculator, often making mistakes, some of which he detected and laments, while others escaped him to the last." (**2**: 182)

Mathematical reasoning. — The talent for mathematical reasoning, illustrated by Kepler, is of enormous importance in scientific thinking and investigating. Many persons, however, possess it in very small degree. Nevertheless, they may still be very useful citizens, owing to their abilities in other lines. As children they should not be denied promotion in the upper grades merely because they fail with problems in percentage.

Understanding people. — The capacity for understanding the thoughts, feelings, temperaments, and actions of other persons is of great importance in getting along with people and in devising and evaluating forms of social organization. Certain eminent figures in history possess this talent to a high degree. Jesus is one example, as shown by his clear-cut characterizations of the different types of his day, particularly in his parables. Æsop and his fables furnish another example. Eminent democratic statesmen, such as Lincoln, are also especially talented in their understanding of people. They not only characterize individuals aptly, but they also sense in a very keen way the thoughts and feelings of great groups, the masses whom they represent and interpret. On the other hand, some persons are so deficient in this capacity that they always think of others as like themselves, or never think at all of the thoughts and feelings that others have. It is highly desirable that all pupils, even the naturally deficient, have this capacity trained to its highest possible efficiency in order to promote better mutual understanding between individuals and social groups. The studies in history and community life, as well as the fables, fairy stories, and other fiction read in the school help to develop this capacity in pupils.

Capacity for managing people; leadership. — Finally, we may note the capacity possessed by great executives and administrators in an eminent degree — the capacity for managing people. The appearance of this capacity in different children and its variations have been significantly discussed by a great American sociologist, Professor Giddings. He describes an example of a little boy of five who had been given two pieces of cake, one being for his three-year-old sister.

> One piece of cake was slightly larger than the other. The boy seemed to know that something or other in his antecedents or his environment created an expectation that he would take the smaller piece of cake, but he did n't. He looked at the two pieces,

went to the sideboard, obtained a knife, carefully cut the smaller piece of cake into two pieces, and then asked his sister whether she would have one piece of cake or two! Don't you know what that boy will do when he becomes an exploiter of schemes, the superintendent of a railroad, or a political boss? (**28**: 437)

Types of leaders. — After this example, Giddings distinguishes between children who are natural-born followers and those who are natural leaders. Continuing, he says:

Now observe the methods of the child who shows early in his life that he will be an instigator, an initiator, a "boss." I use the plain, short word. President, emperor, king — these are dignified personages, but the real man is the "boss." . . . Does the child that you are watching get his way by sheer savage, brute strength? Many children do. Does he get his way by superior courage, or because he sees farther, sees quicker, and keeps on seeing longer than the other children do? Some children get their way by these methods. Or, finally, does he get his way by bartering, or by offering a bribe? . . . I am quite sure that it is necessary to warn all teachers to watch the child who gets his way, perhaps when he is only two or three years of age, by offering bribes. Unless guided he will become one of those human beings of whom so often we read in the newspaper obituaries: "An excellent man in all the private relations of life, a good father, an excellent neighbor, [but] in the accumulation of his fortune and in the methods by which he obtained political distinction and leadership, he too often used methods which brought him into notoriety and under investigation." (**28**: 438)

The highest type of leader: energetic, diligent, intelligent, resourceful, generous, good-natured, likable, moral. — Finally, notice the characteristics of the highest type of capacity for leadership which Giddings brings out in the following paragraphs:

You may find that a child is getting his way, and is beginning to exercise a share in social control by quite another method than any one of these already spoken of. He is not a little brute or a savage. He is not a bribe-giver by nature. He is not clever in the

sense of being tricky. He is none of these things. You notice that within limits he can have his way merely by being energetic and good-natured. Everybody likes him. He creates an atmosphere of vitality, of liveliness. Quite unconsciously the little children around him, all, simply because they like him and like to be with him, spontaneously follow his suggestions. In that child you have the possibilities of a very high type of leadership. It can easily be spoiled; spoiled through vanity or by indulgence. Realize, then, that in that child you have one of the most priceless things in human society — a human being, who, if he develops rightly and is not spoiled in any way, may become one of those leaders of men who have their way and produce results, because, without especially trying or going out of their way, and merely by being naturally superior, and working ceaselessly and generously, according to the initiative of their own minds, they inspire confidence, hold a following, and are obeyed.

If there is anything whatever that is inexcusable in educational methods or institutions, it is the killing off of these priceless things in human character and mind. To fail to kill off the evil things is bad enough, to fail to develop the average possibility is bad enough, but to kill off the rare, priceless things upon which the fullest future progress of mankind depends is the most criminally inexcusable thing that any educational system can be guilty of. Parents, teachers, school boards, politicians, society, all share in this guilt when they fail in his earliest days to discover, to pick out, and properly to train that little child who, as you see by watching him on the playground and in all the ordinary affairs of life, gets his way not by force, nor by bribery, nor by trickery, — the devices of politician and exploiter, — but simply and naturally by sheer intellectual and moral energy, by creating an atmosphere that all little children about him like to get into, and by making them without conscious effort on his own part eager to help him work out his suggestions. For that boy or that girl has in him or in her the making of the finest possible type of leader of men or leader of women. (**28**: 440)

Other capacities. *Read Thorndike.* — In the foregoing paragraphs, in order to impress the reader with the great variety of human capacities and the social value of each, we

described a few of the more important and more tangible ones; namely, the capacities for expression in language, drawing, painting, and music, for acquiring manual skill, for arithmetical computation, for mathematical reasoning, for understanding people, and for managing people. In each case we noted the great variations between individuals in a single capacity. Many more capacities could be cited; for example, Thorndike gives, in addition to the above, the capacities for self-control, energy, precision, thoroughness, originality, coöperation, self-denial, self-reliance, refinement, and sympathy. In order to secure a more adequate understanding of these capacities, students should read the references to Thorndike's works given in the bibliography on page 322. He has done more than any other American to impress teachers and school superintendents with the necessity of adapting school work to differences in the capacities of children. In his "Principles of Teaching," Thorndike discusses not only differences in capacity but also differences in the *temperaments* of children and appropriate treatment. The following statement by Kirkpatrick, of the special treatment needed by a *nervous* child, suggests the problem which Thorndike discusses with many other examples:

> It is especially important that the nervous child should not be scolded, found fault with, or in any way induced to work hard or worry about his work. A teacher who is loud of voice, unattractive in dress, and sudden and variable in manner is especially irritating to a nervous child, and may be the chief occasion of the nervousness. Although a teacher should be quick to note signs of nervousness, she should avoid making the child conscious of his condition. The establishment of regular habits of work and of rest or amusement are of great value in decreasing nervousness. (**30**: 335)

Programs of National Education Association discuss individual differences. — The most tangible evidence of the recent wide interest in individual differences is found in the programs

of educational organizations, notably the National Education Association. In 1910 a large part of the program of its winter meeting was devoted to the topic. In later programs additional papers were presented on the topic.

Study childhood, study children, study each child's talents and deficiencies. From Rousseau to Galton. — Many of the efforts to provide for individual differences which are discussed by the eminent educators to-day are *administrative* in character; that is, they deal with the establishment of special schools, special classes, individual promotions, etc. The chief concern of each *teacher*, however, in providing for individual differences is so to differentiate her class instruction as to vary the pace for the talented and the deficient in each subject, to develop each pupil's special talents toward the greatest usefulness, and to correct his deficiencies to the minimum skill or knowledge which may be socially necessary. In order to do this she must study each child carefully, to determine what individual attention he needs. In doing this she is merely carrying out the program for psychologizing teaching which Rousseau proposed in his "Émile" in 1762, when he said, "Begin, then, by studying your pupils more thoroughly." From Rousseau to Galton and Thorndike, the movement to consider each pupil's capacities and progress has been gaining momentum. For a long time the basis of the movement was sentimental; that is, the "sacredness of the child's individuality" was the central thought. In recent years the value to society of different talents — from the manual skill of the artisan to the mathematical reasoning of a Kepler and the social leadership of a Lincoln — has been important in causing differentiated teaching. Probably the most important and valid influence, however, has been the scientific studies of human nature made by Galton and his followers. Such studies remove the contentions of Rousseau from the realm of sentiment and mere opinion, and transfer them to the realm of scientific conclusions.

Conclusion of discussion of individual differences. — This will conclude our discussion of adapting class instruction to differences in capacity. It will be recalled that we opened the chapter with the simple example of monotones and sweet singers in the same family, and the great difference in the amount and kind of instruction needed to teach them to sing. We then took up examples of school practices which permit slow and fast pupils to advance at appropriate rates. A presentation of statistical data then showed the need of such differentiated teaching for the fast and the slow. Surfaces of frequency were presented to show that only a few very bright and very slow pupils would be found in each capacity in a single class. Scientific studies by Galton and others were then summarized to show that the talents and deficiencies of pupils are commonly due to their inborn equipment; hence, they call for the most sympathetic, reasonable treatment by the teacher. In order to impress the latter with the great variety of valuable possibilities to be found in different pupils, a few of the most important human capacities were described and attention called to the recent enthusiastic interest of American educators in providing differentiated instruction to secure the greatest individual and social happiness through the development of the talents of each pupil.

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CHAPTER XII

PROJECT TEACHING: PUPILS PLANNING PRACTICAL ACTIVITIES

Main points of the chapter. — 1. A pupil project may be defined as some practical activity planned by the pupils.

2. Such planning was early introduced in manual-training and assembly exercises and then extended to other subjects.

3. It is valuable because it gives pupils practice in such practical planning as is frequently found in social life.

4. Project teaching requires of the teacher wide knowledge, executive ability, and skill in directing problem solving.

Definition. — The central element in project teaching is the planning by pupils of some practical activity, — something to be done. Hence a project in teaching is any unit of activity that makes the pupils responsible for such practical planning. It gives them practice in devising ways and means and in selecting and rejecting methods of achieving some definite practical end. This conception conforms with the dictionary definition of a project as "something of a practical nature thrown out for the consideration of its being done," and the statement that "to project" means "to devise," "to scheme." Furthermore, it describes with considerable precision a specific kind of improved teaching that has become common in progressive experimental schools since 1900.

Examples. *Numerous illustrations of such planning in the text.* — In the preceding chapters we have described and pictured numerous examples of teaching in which such planning by the pupils is prominent. The part played by *varied* planning by pupils is particularly well illustrated in the three

pictures of medieval scenes on pages 8, 230, and 232. In this case three different fifth-grade classes all had the same practical problem of illustrating certain phases of medieval life; yet the practical outcomes varied greatly on account of variations in the pupils' planning. Another example of such contrasts in the pupils' planning of similar projects is shown in the construction of two community projects by kindergarten children as pictured on pages 124 and 129. Apart from these contrasting outcomes on the same project, the reader will find illuminating examples of project teaching pictured or described on the following pages: Frontispiece, 14, 15, 18, 65, 121–129, 132–139, 178, 184, 185, 186, 230–241, and 312. Another rich source of examples of projects planned and carried out by pupils is the Twentieth Yearbook of the National Society for the Study of Education, Part I (Public School Publishing Company, Bloomington, Illinois, 1921). More than two hundred projects from all grades are there briefly described.

Construction and expression projects most prominent. — Although project teaching is possible in any subject where the planning of practical jobs is appropriate, it was first undertaken most extensively in the form of construction and expression projects in manual training, history, civics, geography, composition, and assembly exercises. Vivid examples of such constructional and expressional projects are included in the pictures listed above. These show sand-pan constructions in history and geography, community-life constructions planned and executed by kindergarten pupils, the dramatization of historical scenes, and assembly exercises involving drawing construction and dramatization.

Manual training changed from set exercises to pupil projects. — One of the first subjects in which such pupil-planning of practical activities replaced the performance of dictated formal exercises was manual training. As this subject was taught in America from about 1880 until 1900, it

consisted almost exclusively of the making by the pupils of formal exercises in the kindergarten and of the practical Swedish-Sloyd and Russian-machine exercises in the higher grades. Among the earliest efforts to introduce pupil-planning in manual training we find the experiments of Francis W. Parker and John Dewey in their model schools in Chicago about 1900. Another very influential center was Teachers College of Columbia University as described in the first volume of the *Teachers College Record*, 1900, pp. 249–339.

Francis W. Parker's assembly exercises. — A second field in which the pupil-planning of practical activities early found a place was in the morning assembly exercises. Here again Francis W. Parker was a leader, and to-day probably the best source of examples of such assembly programs planned by the pupils is the Second Yearbook (1913) of the Francis W. Parker School (330 Webster Avenue, Chicago, Illinois).

Planning practical activities carried into history, geography, and civics. — Perhaps the next step in the development of project teaching was found in the planning by pupils of constructional and expressional activities in the study of history, geography, and civics. We have pictured above many examples of such teaching from the Elementary School of The University of Chicago, which, under the early leadership of Francis W. Parker and John Dewey, developed a very refined technique of carrying on such teaching. In the kindergarten the illustrations of pupils' community projects pictured above mark a notable reform from the formal gifts and occupations of the earlier kindergartens. In the field of civics the organization of "clean-up" campaigns and similar activities represents an interesting extension of the Dewey influence on a wide scale.

Values of practice in planning practical activities. — The most obvious values of such project teaching are clearly implied in the fact that skill in the planning of practical

activities is very necessary and useful in the world at large. Successful inventors, designers, architects, organizers, managing editors, playwrights, scenario writers, promoters, executives, and the like, all must have skill in planning practical activities. Project teaching anticipates this need by giving pupils practice in such practical planning in the ordinary school, instead of leaving it all to the "hard school of practical experience" after graduation. In addition to this obvious value of such practice in practical planning, project teaching has the additional value of securing attention to certain school topics through appeals to certain practical instinctive interests, as illustrated on pages 230–241.

Limitations of project teaching. — As described above, project teaching is only one type of procedure needed in pupils' training — not an exclusive type. There is much valuable activity and learning in social life (including the school) that does not consist of planning practical activities. In fact, a large part of the work and learning of artisans, clerks, bookkeepers, librarians, teachers, even executives and scientists, consists in the routine juggling of mental and material products. Hence we have a large place in the school for the learning of organized systems of facts from textbooks, and for drill in acquiring routine skills, as illustrated at length in Chapter X. It is significant that while the enthusiasm for project teaching is sweeping the country, at the same time the scientific investigators of methods of teaching reading, spelling, handwriting, and arithmetic are placing very great emphasis on the scientific diagnosis of each pupil's needs in each skill, and on the prescription, by the teacher, of specific practice exercises suited to each pupil's peculiar needs and deficiencies as described above on page 275.

A limited social objective and one mode of learning. By conceiving project teaching as the planning by pupils of practical activities, we thus avoid the danger of overemphasizing it to the exclusion of other social objectives and modes

of learning. Skill in planning practical activities thus becomes one among many coördinate objectives of school teaching, and practice in such planning becomes one among several valuable modes of learning.

Teacher's technique. — The successful direction of the practical planning of pupils probably calls for greater knowledge and skill in the teacher than any other type of teaching. (1) The *wide knowledge* needed is illustrated by some absurd mistakes in matters of scientific and historical fact which I have observed in the project teaching of even highly skilled, experienced teachers. These mistakes arose from the fact that the solution of the practical project problems with which the pupils were concerned carried the class into scientific and historical fields where the teacher was not well informed. (2) In managing *group* projects the teacher commonly needs skill in organizing and directing subdivided labor. She needs to be able to direct the organization of committees, and to keep track of the varied activities of individuals who have been assigned special phases of the project. Thus project teaching requires greater *executive ability* in the teacher than textbook recitations or routinized drill. (3) Finally, the teacher needs skill in guiding pupils in *problematic thinking*. Such skill is discussed at length in the chapter on "Problem Solving" in the author's "Types of Elementary Teaching and Learning" (Ginn and Company).[1] As brought out there, we find that the successful direction of problem solving involves in the teacher skill in getting the pupils to do each of the following: I, Define the problem

[1] Published also in the *Elementary School Journal*, September to December, 1920, Vol. XXI. As defined there, *a problem* is "a question involving doubt." As defined above, a *project* always involves some *practical problem*. Besides such *practical* problems, however, we have purely *theoretical* ones such as "Why does the mist hang on the mountain side?" or "Who was the greater general, Napoleon or Alexander?" Guiding pupils in solving either practical or theoretical problems involves the technique outlined in the author's chapter on problem solving.

clearly; II, Keep the problem in mind; III, Make a variety of suggestions; IV, Criticize and evaluate each suggestion; V, Organize the thinking systematically and summarize from time to time its net outcomes.

Summary of Part II: learning processes, general aspects. — We concluded the *general points of view* presented in Part I of the text with a presentation of the psychological point of view in organizing subject matter; namely, that it should be organized *not* merely in terms of the subject, but as children learn it most readily and effectively. We found that the discussion of how children learn contained so many problems that we devoted to it the seven chapters constituting Part II of the book. In these chapters we presented the following fundamental principles of learning and teaching:

1. Each pupil learns through his own *responses*. Hence what each pupil thinks and does is the great factor in learning and teaching.

2. The pupil's response is greatly influenced by his *past experience*. In order that the pupil may respond with appropriate ideas, meanings, feelings, and attitudes, instead of mere words, the teacher must build carefully upon his past experience and enrich his experience with contacts with real objects and social situations.

3. The pupil's response is also influenced by his *present frame of mind*. Hence, the teacher must arouse appropriate lines of thought and mental backgrounds and attitudes in order to secure the specific educative responses desired of pupils.

4. Among the most important of these attitudes are *attention and interest*. Attention to the school activities is best secured by utilizing the children's active interests in romance and adventure, animals and persons, social approval, rhythm, rime, jingle and song, plays and games, problems, constructions, collections, communications, etc.

5. One of the features of school work that has been most improved through applying the above principles is *drill*. It has been found that ten minutes a day of scientifically organized, snappy, interesting drills, adapted to the individual needs of pupils, suffices to develop the necessary skill in any one of the formal subjects; consequently, most of the day is left free for the other kinds of learning to be carried on in school.

6. The adaptation of drills to the varied needs of individual pupils gives us one of our best examples of the *differentiated instruction* which is necessitated by the great differences in the inborn capacities of pupils and their opportunities for social usefulness.

7. Pupils who have special aptitudes for planning practical activities are given special opportunities to develop these aptitudes in the project teaching that has recently become popular in American schools.

Conclusion of Parts I and II. — The summary on page 155 of the broadening purposes of elementary-school teaching, of economy in classroom management, and of the principles determining the selection and organization of subject matter, together with the above summary of the general aspects of learning, presents some of the most important *general* principles of method. Many *special* applications of these general principles, together with additional facts about learning, arise in discussions of the best ways of teaching children to write, to spell, to read, to cipher, to understand social life, to solve problems, to express themselves, to enjoy themselves in harmless ways, and to behave morally, which are discussed in the author's "Types of Elementary Teaching and Learning."

Enlist for artistic teaching. — Finally, it is suggested that the reader review the discussion of artistic teaching with which this book opened, and endeavor to achieve artistic success and happiness as a teacher along the lines described in the above chapters.

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